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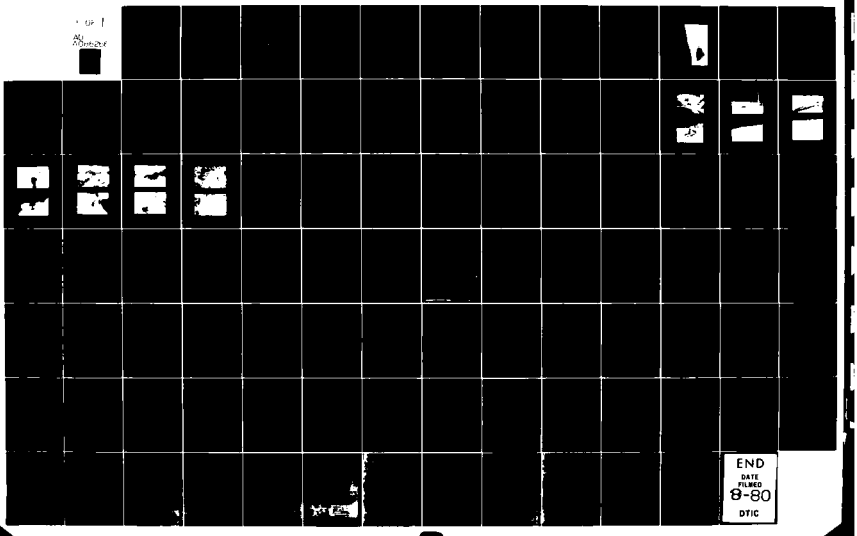

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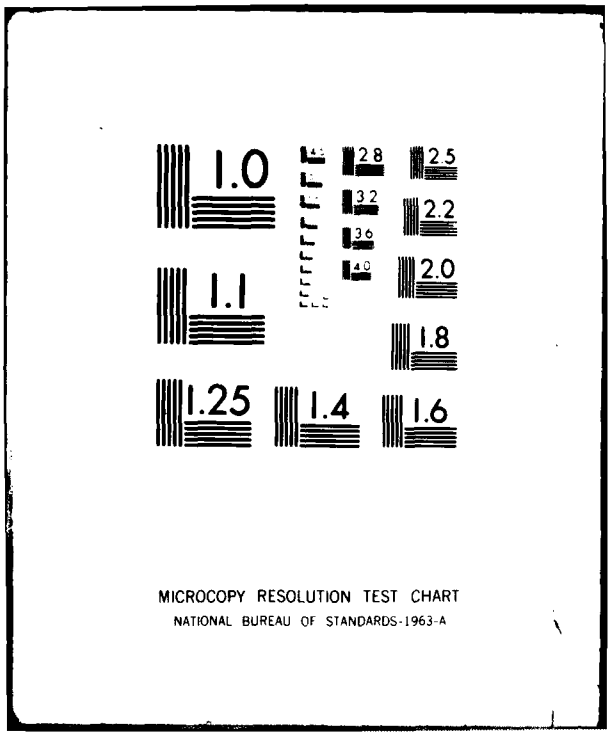
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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A086 266
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Phase I Inspection Report Rexmere Dam Delaware River Basin, Delaware County, NY Inventory No. NY 524	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) (10) George Koch P.E. (12) 94	8. CONTRACT OR GRANT NUMBER(s) (15) DACW 51-79-C-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS New York State Department of Environmental Conservation 50 Wolf Road Albany, NY 12233	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS (11) Feb 80
11. CONTROLLING OFFICE NAME AND ADDRESS New York State Department of Environmental Conservation/ 50 Wolf Road Albany, New York 12233	12. REPORT DATE ~~14 April 1980~~ Feb. 1980 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Department of the Army 26 Federal Plaza/ New York District, CofE New York, New York 10007	15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; Distribution unlimited

(6) National Dam Safety Program. Rexmere Dam (Inventory Number NY 524) Delaware River Basin, Delaware County, New York. Phase I Inspection Report.

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Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability

Rexmere Dam
Delaware County
Stamford

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

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Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Using the Corps of Engineer's Screening Procedure for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms which exceed 14% of the Probable Maximum Flood (PMF) inflow. A flood wave analysis, assuming breaching of the dam, indicates that water surface levels downstream of the dam would depths which would pose significant danger to residents. The spillway is, therefore, adjudged as seriously inadequate and the dam assigned as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does seem that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

In addition to the spillway inadequacy, there is a wet area on the natural slope beyond the toe of the embankment near the west abutment. Further investigation is required to determine the cause of the wet area. If it is found to be necessary, a method of treatment of the wet area should be devised. Other deficiencies noted include brush and small trees growing on the embankment, undermined riprap at the downstream end of the spillway outlet channel, minor joint separations and deterioration on the spillway pipe-arches, and deterioration of the valve box.

It is recommended that within 3 months of the date of the notification of the owner, a hydrologic investigation of the structure should be undertaken. Investigation into the wet area near the west abutment should also be commenced within 3 months. Within 18 months of the date of notification, appropriate remedial measures for the spillway inadequacy should be taken. If it is found to be necessary, treatment of the wet area should be completed within 12 months. Other deficiencies outlined above should also be corrected within 12 months. A detailed emergency evacuation plan and warning system should be developed within 3 months of notification.

RT. Feb 1980
per J. Lombardi

DELAWARE RIVER BASIN

REXMERE DAM

DELAWARE COUNTY, NEW YORK
INVENTORY NO. N.Y. 524

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

CONTRACT NO. DACW-51-79-C0001

NEW YORK DISTRICT CORPS OF ENGINEERS

FEBRUARY, 1980

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
REXMERE DAM
I.D. No. NY 524
DELAWARE RIVER BASIN
DELAWARE COUNTY, NEW YORK

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Rexmere Dam (I.D. No. NY 524)
State Located:	New York
County:	Delaware
Stream:	Unnamed Tributary of Delaware River
Date of Inspection:	November 1, 1979

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Using the Corps of Engineer's Screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by all storms which exceed 14% of the Probable Maximum Flood (PMF) inflow. A flood wave analysis, assuming a breaching of the dam, indicates that water surface levels downstream of the dam could reach depths which would pose significant danger to residents. The spillway is, therefore, adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

In addition to the spillway inadequacy, there is a wet area on the natural slope beyond the toe of the embankment near the west abutment. Further investigation is required to determine the cause of the wet area. If it is found to be necessary, a method of treatment of the wet area should be devised. Other deficiencies noted include brush and small trees growing on the embankment, undermined riprap at the downstream end of the spillway outlet channel, minor joint separations and deterioration on the spillway pipe-arches, and deterioration of the valve box.

It is recommended that within 3 months of the date of the notification of the owner, a hydrologic investigation of the structure should be undertaken. Investigation into the wet area near the west abutment should also be commenced within 3 months. Within 18 months of the date of notification, appropriate

remedial measures for the spillway inadequacy should be taken. If it is found to be necessary, treatment of the wet area should be completed within 12 months. Other deficiencies outlined above should also be corrected within 12 months. A detailed emergency operation plan and warning system should be developed within 3 months of notification.

George Koch

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

for

Col. Clark H. Benn
New York District Engineer

Date: 14 Apr 80

OVERVIEW
Rexmere Dam
I.D. No. NY 524

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
REXMERE DAM
I.D. No. NY 524
#160A-3493
DELAWARE RIVER BASIN
DELAWARE COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Rexmere Dam is an earth dam with two ungated pipe arches which form the spillway.

The embankment is 27 feet high and 350 feet long. The crest is 30 feet wide. The embankment slopes are 1V on 3.25H on the upstream slope and 1V on 2.75H on the downstream slope. The upstream slope is lined with heavy stone riprap.

The spillway consists of two 40 inch by 65 inch bituminous coated corrugated metal pipe-arches located in the upper portion of the embankment. The pipe arches are both 30 feet long and there are headwalls at each end. The channel on the downstream slope of the dam is lined with concrete for the first 30 feet and is concreted riprap for the remainder of its length.

The dam has a 12 inch diameter cast iron pipe for a reservoir drain. There is a concrete box covered by a trash grill at the inlet to this pipe. An eleven foot high valve box on the downstream slope of the dam houses the valve which controls flow in this pipe. The pipe extends for 15 feet beyond the valve box to a headwall at the outlet to the pipe. This headwall and outlet pipe are submerged by the water of Churchill Lake, which is located downstream of the Rexmere Dam.

b. Location

The Rexmere Dam is located on Windemere Road which is off NY Route 23 in the Town of Harpersfield. The dam is approximately one quarter mile north of the Route 23 - Route 10 intersection near Stamford.

c. Size Classification

The dam is 27 feet high and has a maximum storage capacity of 104 acre feet. Therefore, the dam is in the small size category as defined by the Recommended Guidelines for the Safety Inspection of Dams.

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of a small dam, N.Y. Routes 23 and 10, a mobile home park containing 12 trailers, and 6 homes downstream of the dam.

e. Ownership

The dam is owned by the Village of Stamford, New York. Mr. Cecil Ballard, Superintendent of Public Works for the village was contacted at the time of the inspection. The phone number for the village offices of Stamford is (607) 652-6671.

f. Purpose of Dam

The primary purpose for this dam is to maintain the level of the lake for recreational purposes.

g. Design and Construction History

This dam was constructed in 1965 and 1966. It replaced several smaller dams which had been located in the area flooded by the new pond. The dam was designed by Floyd E. Snyder, P.E. The plans for the dam prepared by Mr. Snyder in 1965 were available and have been included in Appendix F.

h. Normal Operating Procedures

Water flows through the ungated pipe-arches. There are no regular operating procedures.

1.3 PERTINENT DATA

a. Drainage Area (acres)	654
b. Discharge at Dam	
Pipe-Arches water surface at Elev. 1864	242
Reservoir Drain-water surface at elev. 1864	11
c. Elevation(USGS Datum)	
Top of Dam	1864.0
Invert of Pipe-Arches	1859.0
Invert of Reservoir Drain Pipe	1838.38
d. Reservoir-Surface Area (acres)	
Top of Dam	13.3
Invert of Pipe-Arches(Elevation 1859.0)	8.26
e. Storage Capacity (acre-feet)	
Top of Dam	104
Invert of Pipe-Arches (Elevation 1859.0)	51

f. Dam

Embankment Type-Earth fill with riprap on upstream face.

Embankment Length (feet) - 350

Slopes (V:H)	Upstream	1 on 3.25
	Downstream	1 on 2.75
Crest Width (feet)		30

g. Spillway

Type: Two 40 inch by 65 inch bituminous coated corrugated metal pipe arches, each 30 feet long. Concrete headwalls on both ends of pipes. Concrete lined outlet channel for first 30 feet, concreted riprap to end of channel.

h. Reservoir Drain

Type: 12 inch diameter cast iron pipe (181 ft. long) with inlet box covered by trash grill. Concrete headwall at pipe's outlet.

Control: Armco Model 50-10 Valve-located in 11 foot high valve box on downstream slope.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Rexmere Dam is located in the Catskill Mountain physiographic province of New York State. This province is a part of the Appalachian Plateau. The area is underlain by a great thickness of sedimentary rocks from the Devonian Era which lie almost horizontal. Glaciation and the action of streams have carved deep valleys in the flat lying rock. Summit elevations rise to between 3,000 and 4,000 feet. A review of the "Brittle Structures Map of the State of New York" indicated that there are no faults in the immediate vicinity of the dam. The surficial soils and features of the area are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

The application for the construction of the dam filed in 1965 stated that modified undisturbed soil samples were obtained from test borings. The application further stated that the foundation soil was hardpan and boulders. However, the actual logs of the soil borings were not available.

2.2 DESIGN RECORDS

The design records which were available consisted of the plans prepared by Floyd E. Snyder, P.E., the application for the construction of the dam, and computations which were performed by staff engineers from the Department of Public Works during the review of the application. Selected sheets from the plans have been included in Appendix F.

2.3 CONSTRUCTION RECORDS

The plans prepared by Floyd Snyder were the primary construction records available. Reports from two field inspections conducted during construction by representatives of the Department of Public Works were also available. These reports included a series of photographs taken during construction. Some of these photos have been included in Appendix A.

2.4 OPERATION RECORDS

No operation records were available

2.5 EVALUATION OF DATA

The data presented in this report was obtained from the Department of Environmental Conservation files. The information available appears to be adequate and reliable for Phase 1 inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Rexmere Dam was conducted on November 1, 1979. The weather was sunny and the temperature was in the fifties. At the time of the inspection, water was flowing to a depth of less than 1 inch in each of the spillway pipes.

b. Embankment

Inspection of the embankment revealed one potentially serious deficiency and several minor defects. There was a wet area on the natural slope near the west abutment. While no points of concentrated seepage were observed, the ground was saturated on the hillside beyond the toe of slope. The top of this wet area was at approximately the same level as the water surface in the reservoir and the area extended to the base of the hill. The vegetation in the area was indicative of wet conditions.

The minor deficiencies noted included some brush and small trees growing on the embankment in several locations and several minor irregularities on the embankment crest caused by the road which runs along the crest.

c. Spillway

Several deficiencies were observed on the spillway section. There was an inward bulge on the crown of each of the pipe arches. These bulges were located approximately at the midpoint of each pipe. There were a number of places where the bituminous coating material had worn off the pipes resulting in discoloration and corosion of the metal. There were joint separations on both of the pipes. The separations on the eastern pipe were along the invert and had been filled with joint sealing material. On the western pipe, there was a separation at the crown of the pipe. This separation was 1 inch wide and about 12 inches long.

Other deficiencies observed were on the downstream portion of the spillway. The downstream headwall was cracked above and to the right (looking upstream) of the eastern pipe arch. Finally, there were three areas where the concrete and riprap at the end of the channel had been undermined, resulting in subsidence of the riprap. Water was entering these areas from the spillway channel and was flowing beneath these depressed sections.

d. Reservoir Drain

Most of the components of the reservoir drain were unobservable; however, several defects were noted on the portions which were inspected. The valve box on the downstream toe of the dam was in poor condition. The exposed concrete on this box was seriously deteriorated and leaking. The well formed by the box was full of water at the time of the inspection. The source of this water could not be determined. The outlet of the drain pipe was submerged by the water from the downstream lake.

e. Downstream Area

The downstream area is flooded by Churchill Lake. The dam on Churchill Lake is approximately 900 feet downstream of the Rexmere Dam.

f. Reservoir

There were no signs of soil instability in the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. A wet area on the natural slope near the west abutment of the dam.
2. Some brush and small trees growing on the embankment.
3. Minor surface irregularities on the embankment crest.
4. Bulges on the spillway pipe-arches.
5. Spots on the pipe-arches where the bituminous coating material had worn off.
6. A joint separation on the crown of the western pipe arch.
7. Cracks on the headwall at the outlet end of the pipe-arches.
8. Undermined riprap at the downstream end of the spillway channel.
9. Deteriorated concrete on the valve box for the reservoir drain.
10. Water fills the well containing the reservoir drain's valve.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURE

4.1 Procedure

There are no established operating procedures for this structure. The reservoir has been drained several times since its construction, but this is not done on a regular basis.

4.2 Maintenance of Dam

The dam is maintained by the Village of Stamford. The embankment is mowed regularly and other maintenance is performed as required.

4.3 Warning System In Effect

No apparent warning system is present.

4.4 Evaluation

The operation and maintenance procedures for this dam appear to be generally satisfactory. Increased maintenance efforts are required to correct the deficiencies which exist.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 Drainage Area Characteristics

Delineation of the watershed draining into the reservoir pool area was made using the USGS 7.5 minute quadrangles for Harpersfield and Stamford, New York. The drainage area is 654 acres and consists of open fields and wooded land. A portion of the drainage area lies to the southwest of N.Y. Route 23. This one hundred seventy five acre segment has been included in the drainage area of the dam based on the assumption that culverts exist which will carry runoff under the state highway. Relief in the drainage area is moderate to steep with slopes of up to 16 per cent in the northern portion of the area.

5.2 Analysis Criteria

The analysis of the floodwater retarding capability of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program develops an inflow hydrograph using the "Clark Unit Hydrograph" method and then uses the "Modified Puls" flood routing procedure. The spillway design flood selected was the PMF in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

5.3 Spillway Capacity

The dam has two pipe-arches located in the center of the upper portion of the embankment. These pipe arches operate as culverts under inlet control conditions. A reservoir drain pipe could provide a small amount of additional discharge capacity. The discharge capacity of this drain was neglected during the analysis since operation of the valve would be required to permit this discharge.

The spillway pipe-arches do not have sufficient capacity for discharging the peak outflow from either the Probable Maximum Flood (PMF) or one half the PMF. For the PMF, the peak inflow is 3009 cfs and the peak outflow is 3009 cfs. For one half the PMF, the peak inflow is 1505 cfs and the peak outflow is 1505 cfs. The computed spillway capacity for a water surface elevation at the top of dam is 242 cfs.

5.4 Reservoir Capacity

Storage capacity of the reservoir between the invert of the pipe arches (elevation 1859.0) and the top of the dam (elevation 1864.0) is 53 acre feet, which is equivalent to a runoff depth of 0.97 inches over the drainage area. The total storage capacity of the dam is 104 acre feet.

5.5 Floods of Record

No records were available regarding the occurence of the maximum known flood. Mr. Ballard, Superintendent of Public Works estimated that the maximum depth of flow in the pipe-arches has been about 1 foot. The discharge resulting from this water level would be 28 cfs.

5.6 Overtopping Potential

Analysis using the PMF and one half the PMF indicates that the dam does not have sufficient spillway capacity. For a PMF peak outflow of 3009 cfs, the dam would be overtopped to a computed depth of 1.88 feet. For the peak outflow from one half the PMF, the depth of overtopping would be 1.11 feet. The dam would be overtopped by all storms exceeding 14% of the PMF inflow.

5.7 Downstream Effects

Downstream of the Rexmere Dam is another dam which forms a pond known as Churchill Lake, and a highway embankment for NY Route 23, which forms a third dam. Beyond that embankment is a group of mobile homes which are close to the stream channel. These trailers are the first dwellings which would be affected by a dam failure.

The analysis of Rexmere Dam indicates that the peak outflow from either the PMF or one half the PMF would result in the Rexmere Dam and the Churchill Lake Dam as well as the Route 23 highway embankment being overtopped. The table below shows the maximum flow and water surface elevation which will occur in the vicinity of the trailers under several conditions.

PERCENTAGE OF PMF	(MAX. RESERVOIR ELEV.	DEPTH OF OVERTOPPING (IF NO BREACH)(FT)	OCCURANCE OF BREACH	MAXIMUM FLOW AT TRAILER PARK (CFS)	MAX. WATER ELEV. AT TRAILER PARK
14	1863.91	0	NO	233	1796.1
15	1864.06	-	YES	2019	1800.8
50	1865.11	1.11	NO	1502	1800.6
50	1864.31	-	YES	2583	1801.0
100	1865.88	1.88	NO	3019	1801.1
100	1864.44	-	Yes	3026	1801.1

Several facts about the water surface elevation at the trailer park should be noted. First, when the area is subjected to flows from either the PMF or one half the PMF, the effect of dam breaching on the water surface elevation at the trailer park is minimal. This means that under either of these conditions, the entire area would be flooded and the additional effect of dam failure would not be dramatic. In constrast, a dam failure under a lesser flow would result in a more noticeable rise in water surface elevation. This difference can be noted by comparing the elevations resulting from 14% and 15% of the PMF. Therefore, failure of the dam would significantly increase the hazard to loss of life downstream of the dam.

5.8 Evaluation

Using the Corps of Engineers screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 14% of the PMF inflows. A flood wave analysis, assuming a complete breaching of the dam, indicates that the water surface levels downstream of the dam could reach depths which pose a significant danger to residents.

The spillway is, therefore, adjudged to be seriously inadequate and the dam is assessed as unsafe, non-emergency.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

Visual observations of the structure revealed a number of deficiencies. A wet area on the slope just beyond the downstream toe of the embankment was observed. Since the top of this wet area is at approximately the same elevation as the water level in the reservoir, seepage through the abutment would seem to be the cause. Among the other deficiencies noted were bulging of the spillway pipe-arches, undermining of riprap at the end of the spillway channel, and deteriorating concrete on the reservoir drain valve box.

b. Design and Construction Data

Construction plans for this structure, prepared by Floyd E. Snyder P.E., were available and have been included in Appendix F. Additional data available included the application for the construction of the dam and photographs taken during construction.

c. Seismic Stability

The dam is located in Seismic Zone 1. Since the seismic coefficient is small, a seismic stability analysis is not performed.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 Assessment

a. Safety

The Phase 1 inspection of the Rexmere Dam revealed that the spillway is seriously inadequate and all storms which exceed 14% of the inflow from the PMF would overtop the dam. This overtopping could cause breaching of the dam and the resulting floodwave would significantly increase the hazard to downstream residents. For this reason, the dam has been assessed as unsafe non-emergency.

The other potentially serious deficiency on this structure is a wet area beyond the toe of the slope at the west abutment. This area should be investigated to determine if it is caused by seepage through the dam and appropriate remedial actions should be taken.

b. Adequacy of Information

The information which was available for the preparation of this report was adequate.

c. Need for Additional Investigations

Since the spillway was assessed as seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed.

An investigation into the cause of the wet area on the slope near the west abutment of the embankment is also required.

d. Urgency

The additional hydrologic/hydraulic investigations which are needed should be commenced within 3 months of the date of notification of the owner. Within 18 months, appropriate remedial mitigating measures should have been completed.

The investigation of the wet area should also be commenced within 3 months. Remedial actions on the wet area which are deemed necessary based on the results of these investigations should be taken within 12 months of the date of notification of the owner.

The other deficiencies indicated below should also be corrected within 12 months.

7.2 Recommended Measures

a. After the hydrological investigations have been completed, mitigating measures dealing with the seriously inadequate spillway capacity should be determined.

b. The wet area on the slope near the west abutment should be investigated and if it is found necessary, appropriate remedial measures should be taken.

c. Brush and small trees growing on the embankment should be cut.

d. The undermined riprap at the downstream end of the spillway channel should be repaired.

e. A monitoring program should be established to periodically inspect the cracks on the spillway outlet headwall as well as the bulges on the pipe-arches and determine whether these conditions are worsening.

f. Surface irregularities on the crest should be repaired and measures should be taken to prevent unnecessary traffic from crossing the crest.

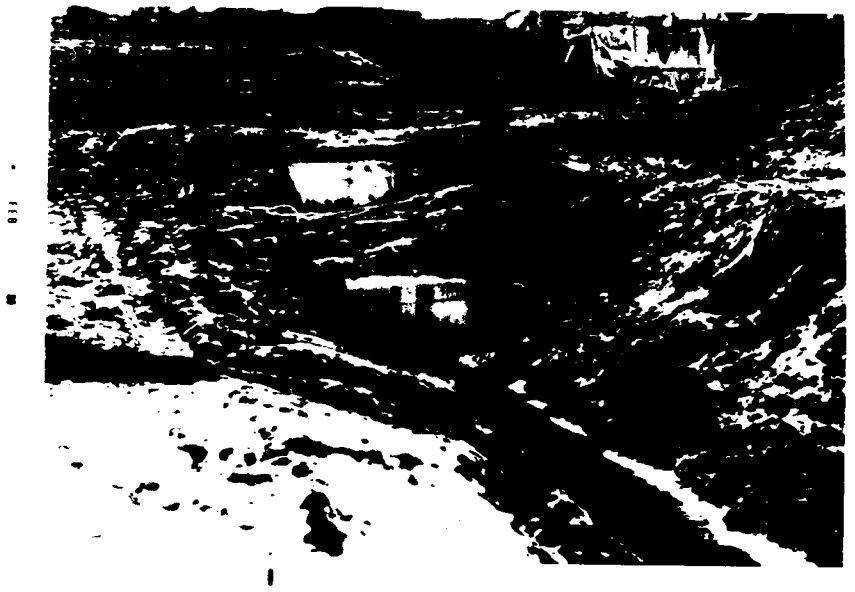
g. Minor deficiencies with the spillway pipe-arches such as the joint separations and the spots where the bituminous coating has worn off should be monitored and repaired if the conditions become more serious.

h. The reservoir drain should be made operable. The valve box for the reservoir drain should be repaired. The major defects which must be addressed are the deterioration of the concrete on the box and the fact that the box is full of water.

i. An emergency action plan for the dam should be developed.

APPENDIX A

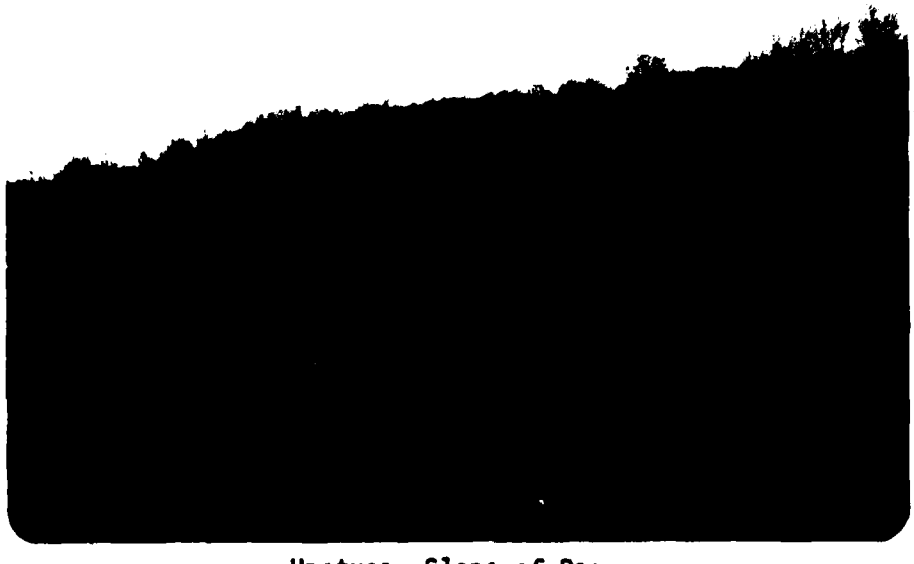
PHOTOGRAPHS



Reservoir Drain Valve Box and Outlet During Construction (December, 1965)

Spillway Outlet Channel and Downstream Slope During Construction (June, 1966)

Overview of Rexmere Dam with Churchill Lake Dam Downstream

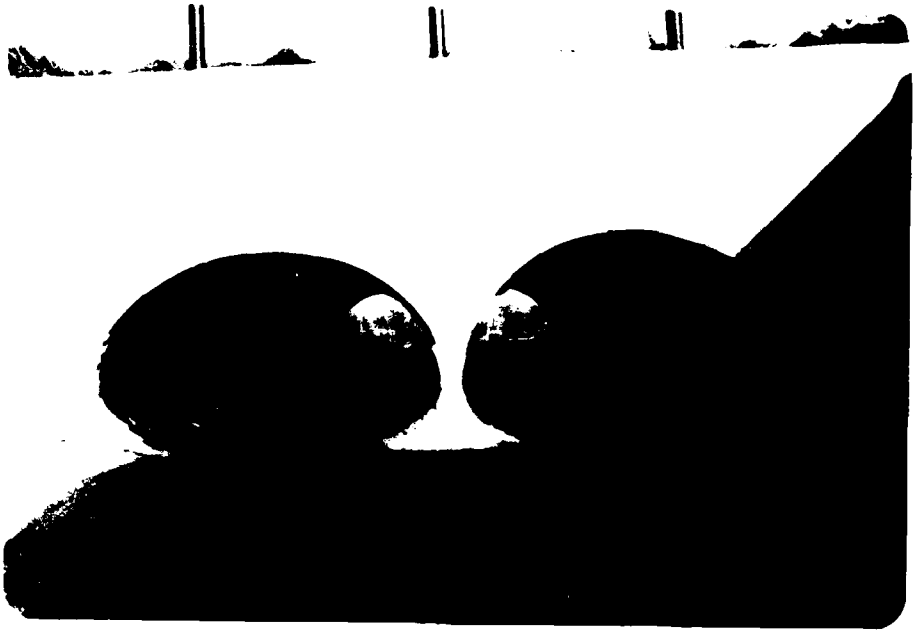


Upstream Slope of Dam

Downstream Slope of Dam; Wet Area at Far End of Embankment

Wet Area Beyond Toe of Slope on Western End of Embankment

Inward Bulge on Eastern Pipe-Arch

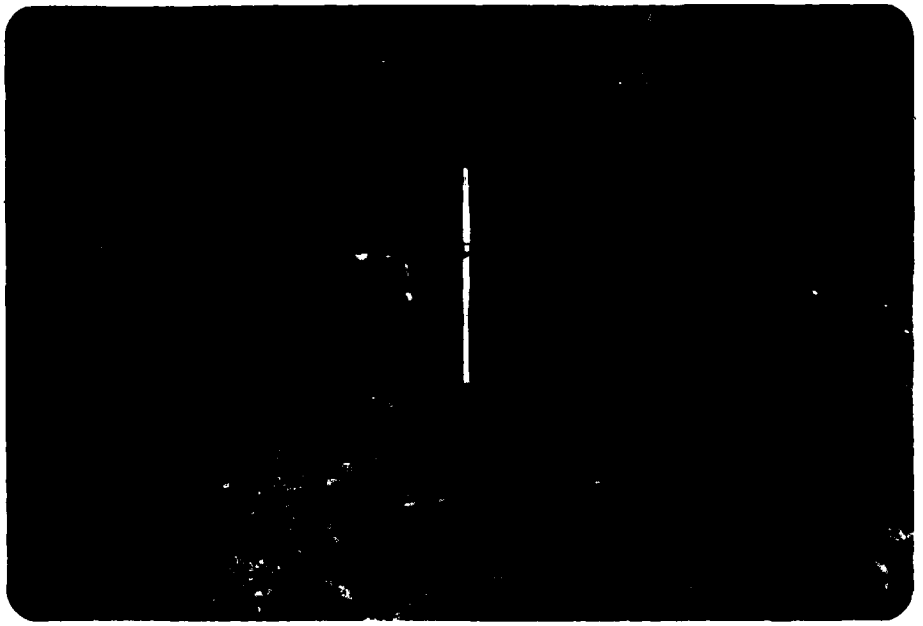


Headwall at Outlet of Pipe-Arches - Note Cracks in Wall above Right Pipe-Arch

Outlet Channel for Spillway

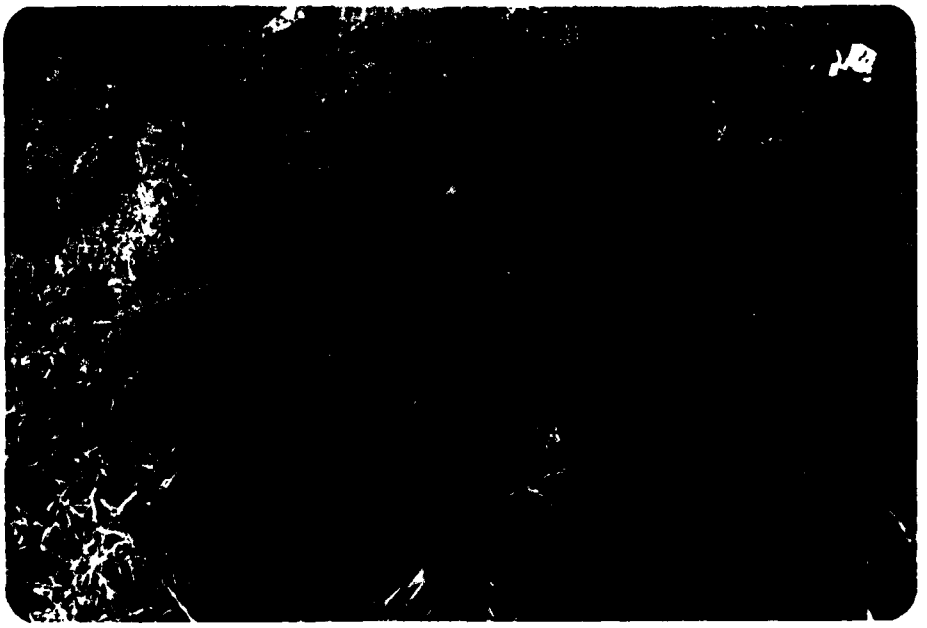
Lower Portion of Outlet Channel

Undermined Rip-rap near Lower End of Outlet Channel



Settlement of Undermined Riprap on Outlet Channel

Deteriorated Concrete on Reservoir Drain Valve Box



Reservoir Drain Valve Box with Cover Partially Removed, Note Water which Fills Box

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam REXMERE DAM

Fed. I.D. # 524 DEC Dam No. 160A-3493

River Basin DELAWARE

Location: Town HARPERSFIELD County DELAWARE

Stream Name UNNAMED TRIBUTARY

Tributary of DELAWARE RIVER

Latitude (N) 42° 24.8' Longitude (W) 74° 37.8'

Type of Dam EARTH

Hazard Category C

Date(s) of Inspection 11/1/79

Weather Conditions 50° SUNNY

Reservoir Level at Time of Inspection 1/2" DEEP ABOVE LEVEL APRON AT INLET

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted (Including Address & Phone No.)

CECIL BALLARD - SUPERINTENDENT OF PUBLIC WORKS

VILLAGE OF STAMFORD, N.Y.

VILLAGE OFFICES-(607) 652-6671

d. History:

Date Constructed 1966 Date(s) Reconstructed

Designer FLOYD E. SNYDER, P.E.

Constructed By MONEY PROVIDED BY MURPHY FOUNDATION

Owner VILLAGE OF STAMFORD

2) Embankment

a. Characteristics

(1) Embankment Material _____

(2) Cutoff Type NONE

(3) Impervious Core NONE

(4) Internal Drainage System NONE

(5) Miscellaneous _____

b. Crest

(1) Vertical Alignment SATISFACTORY - SOME SMALL DEPRESSIONS IN ROAD - POTHOLES

(2) Horizontal Alignment SATISFACTORY

(3) Surface Cracks NONE APPARENT

(4) Miscellaneous _____

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1 ON 3

(2) Undesirable Growth or Debris, Animal Burrows BRUSH AT WEST ABUTMENT

(3) Sloughing, Subsidence or Depressions NONE

(4) Slope Protection HEAVY STONE RIPRAP – UNIFORM SLOPE

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 ON 2.5

(2) Undesirable Growth or Debris, Animal Burrows SEVERAL SMALL TREES.

(3) Sloughing, Subsidence or Depressions NONE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage DOWNSTREAM OF TOE - ALONG RIGHT ABUTMENT & NATURAL GROUND CONTACT - WET AREA BEGINS AT SAME ELEVATION AS LAKE LEVEL. EXTENDS FROM THERE DOWN TO TOE

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

(7) Condition Around Outlet Structure SATISFACTORY

(8) Seepage Beyond Toe NOTED ABOVE UNDER SEEPAGE

e. Abutments - Embankment Contact

(1) Erosion at Contact NONE

(2) Seepage Along Contact YES - AT WEST ABUTMENT - SEE 2-d-5

3) Drainage System

a. Description of System NONE

b. Condition of System

c. Discharge from Drainage System

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

NONE

5) Reservoir

a. Slopes

b. Sedimentation NONE APPARENT

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) CHURCHILL LAKE DAM, RTE 23, TRAILER PARK WITH 12 TRAILERS, RTE 10, 6 HOMES

b. Seepage, Unusual Growth NONE

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel SPILLWAY CHANNEL FLOWS INTO CHURCHILL LAKE

7) Spillway(s) (Including Discharge Conveyance Channel)

2 PIPE-ARCHES - CONCRETE & CONCRETED RIPRAP DISCHARGE CHANNEL.

a. General SATISFACTORY - DOWNSTREAM HEADWALL AT EASTERN PIPE ARCH HAS 1 VERTICAL & 1 DIAGONAL CRACK ALONG ENTIRE FACE.

b. Condition of Service Spillway BOTH PIPES BITUMINOUS COATED - BOTH HAVE SOME COATING MISSING & DISCOLORATION & CORROSION IN THOSE SPOTS. BOTH PIPES HAVE AN INWARD BULGE NEAR THE CENTER. WESTERN PIPE ARCH HAS A JOINT SEPARATION (1" x 12") AT THE CROWN IN THE UPSTREAM 1/3 OF PIPE. EASTERN PIPE ARCH HAS SEVERAL JOINT SEPARATIONS ALONG INVERT WHICH HAVE BEEN PLUGGED WITH JOINT SEALER.

c. Condition of Auxiliary Spillway N/A

d. Condition of Discharge Conveyance Channel CONCRETE SECTION SATISFACTORY BELOW CONCRETE - HEAVY RIPRAP IMBEDDED IN CONCRETE. THREE AREAS WHERE IT HAS BEEN UNDERMINED. WATER IS FLOWING BENEATH RIPRAP & IS EMERGING NEAR THE END OF THE CHANNEL

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other CAST IRON

Size: 12' Length 181'

Invert Elevations: Entrance 1838.38 Exit 1834.5

Physical Condition (Describe): Unobservable X

Material: WELL IS CONCRETE & IS HIGHLY DETERIORATED.

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve X Uncontrolled _____

Operation: Operable X Inoperable _____ Other _____

Present Condition (Describe): VALVE WELL IS FULL OF WATER HAS BEEN PUMPED OUT IN PAST BUT IT FILLS RIGHT BACK UP NO POINT OF SEEPAGE WAS OBSERVED. THE COVER FOR THE WELL WAS NOT FASTENED DOWN & COULD EASILY BE REMOVED. MR. BALLARD SAID DRAIN WAS OPERABLE.

9) Structural

a. Concrete Surfaces SATISFACTORY EXCEPT FOR THE TOP OF THE RISER FOR THE RESERVOIR DRAIN - CONCRETE THERE WAS SERIOUSLY DETERIORATED

b. Structural Cracking EASTERN PIPE ARCH - THERE ARE SEVERAL CRACKS IN DOWNSTREAM HEADWALL - 1 VERTICAL 1 HORIZONTAL

c. Movement - Horizontal & Vertical Alignment (Settlement) NONE APPARENT

d. Junctions with Abutments or Embankments

e. Drains - Foundation, Joint, Face PIPE DRAINS THROUGH CONCRETE WALLS ON DOWNSTREAM SPILLWAY CHANNEL - NO FLOW IN PIPES

f. Water Passages, Conduits, Sluices

g. Seepage or Leakage NONE

h. Joints - Construction, etc. ALL SATISFACTORY - EXCEPT FOR TOP OF RESERVOIR DRAIN OUTLET WELL

i. Foundation SATISFACTORY

j. Abutments N/A

k. Control Gates SATISFACTORY

l. Approach & Outlet Channels SOME UNDERMINING ON DOWNSTREAM END OF CHANNEL

m. Energy Dissipators (Plunge Pool, etc.) NONE

n. Intake Structures

o. Stability

p. Miscellaneous

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1864.0	13.26	104
2) Invert-Eastern Pipe-Arch	1859.04		51
3) Invert-Western Pipe-Arch	1858.92		
4) Pool Level with Flashboards			
5) Service Spillway Crest			

DISCHARGES

	Volume (cfs)
1) Average Daily	
2) Spillway @ Maximum High Water	242
3) Spillway @ Design High Water	
4) Spillway @ Auxiliary Spillway Crest Elevation	
5) Low Level Outlet	11
6) Total (of all facilities) @ Maximum High Water	28
7) Maximum Known Flood	

CREST: ELEVATION: 1864.0

Type: EARTH - BROAD CRESTED WEIR

Width: 30FT Length: 350FT

Spillover 2- PIPE ARCHES

Location CENTER OF EMBANKMENT

SPILLWAY:

PRINCIPAL		EMERGENCY
1859.0	Elevation	
2-PIPE ARCHES 40" X 65" FULLY BITUMINOUS COATED CULVERTS	Type	NONE
	Width	
	Type of Control	
✓	Uncontrolled	
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES:

Type: Gate ✓ Sluice _____ Conduit _____ Penstock _____

Shape : CIRCULAR

Size: 12 INCH

Elevations: Entrance Invert 1838.38

Exit Invert 1834.5

Tailrace Channel: Elevation _____

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

OPERATION OF GATE ON RESERVOIR DRAIN

DRAINAGE AREA: 654 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: _____

Terrain - Relief: STEEP - FORESTED TO RESERVOIR EDGE

Surface - Soil: _____

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
REXMERE DAM	1		
SUBJECT		COMPUTED BY	DATE
HYDROLOGIC/HYDRAULIC COMPUTATIONS		RLW	1/24/80

DRAINAGE AREA

HARPERSFIELD QUADRANGLE $6.17\ in^2$

STAMFORD QUADRANGLE $.95\ in^2$

$7.12\ in^2$

$(7.12\ in^2)(91.83\ Ac/in^2) = 653.83\ ACRES = 1.02\ mi^2$

CLARK HYDROGRAPH COEFFICIENTS

$L = 9924\ ft - 1454\ ft = 8510\ ft = 1.61\ mi.$

$S_t = .5\%$

$S_{10/85} = \frac{2000^{ft} - 1297\ ft}{1.42\ mi} = 100.7\ ft/mi$

$$TC = \frac{(5.33)(L^{.602})(S_t^{.231})}{S_{10/85}^{.448}} = \frac{5.33(1.61^{.602})(.5^{.231})}{100.7^{.448}} = .766$$

$$R = \frac{17.6(L^{.339})(S_t^{.258})}{S_{10/85}^{.86}} = \frac{17.6(1.61^{.339})(.5^{.258})}{100.7^{.86}} = .328$$

TP-40 PMP RAINFALL

PMP RAINFALL (6 HOUR - 1050 MI) = 23 IN

6 HR = 100% 24 HR = 115%

12 HR = 107% 48 HR = 123%

$$TRSPC = 1 - \frac{.300^{sq\ mi}}{(1.02)^{.1478}} = .70$$

LOSS DATA: 1.0" CONTINUOUS = .1"

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
REXMERE DAM	2		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	1/24/80

BASE FLOW = 2 cfs

ELEVATIONS -

TOP OF DAM 1864.0

INVERT OF PIPE ARCHES 1859.0 *

* ACTUAL INVERT ELEVATIONS
1858.92 & 1859.04
AVERAGED TO 1859.0

INVERT OF RES. DRAIN 1838.38

SURFACE AREAS AT VARIOUS ELEVATIONS - TAKEN FROM SNYDER PLANS

ELEVATION	SURFACE AREA (ACRES)
1862	11.13
1856	5.83
1850	1.97
1840	0.03

EXTRAPOLATE SURFACE AREA TO TOP OF DAM

USE CONIC PROJECTION

ELEVATION

$A_1 = 11.13$ $R_1 = \sqrt{\frac{(11.13)(43560)}{\pi}} = 392.8$ — 1862

$A_2 = 5.83$ $R_2 = \sqrt{\frac{(5.83)(43560)}{\pi}} = 284.3$ — 1856

$\frac{\Delta A}{\Delta V} = \frac{392.8 - 284.3}{1862 - 1856} = 18.08$

$R_3 = 392.8 + 18.08(2) = 428.9$

$A_3 = \pi R^2 = \pi (428.9)^2 = 13.46$ ACRES AT ELEVATION 1864

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
REXMERE DAM	3		
SUBJECT		COMPUTED BY	DATE
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	1/24/86

DISCHARGE CAPACITY CALCULATIONS

DETERMINE CAPACITY WITH NOMOGRAPH (SEE FOLLOWING PAGE)

ELEVATION	HW/D	DISCHARGE (cfs)	TOTAL DISCHARGE (TWO PIPES) (cfs
1859.0	0	0	0
1862.33	1.0	78	156
1863.83	1.45	118	236
1864.0	1.5	121	242

RESERVOIR DRAIN CAPACITY

WATER SURFACE AT ELEVATION 1864.0

CENTER LINE AT OUTLET = 1835 $A = \pi(.5)^2 = .78$

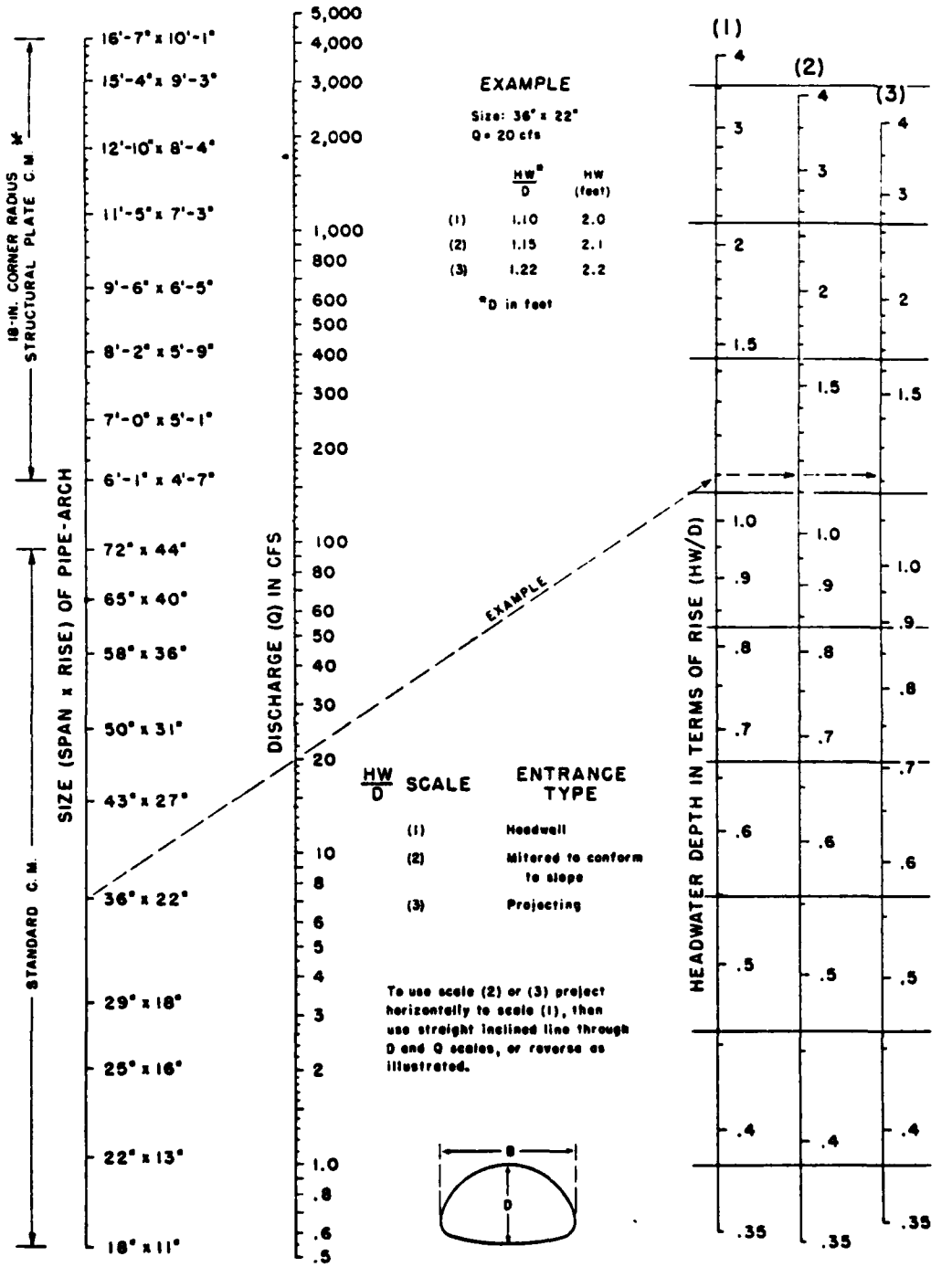
$$Q = .78\sqrt{\frac{2(32.2)(29)}{1+.5+.043(181)}} = 11.17 cfs$$

MAXIMUM KNOWN FLOOD - ESTIMATE 1' DEEP

FROM NOMOGRAPH $HW/D = .35$ $Q = 14 cfs$

TOTAL DISCHARGE = (14 cfs)(2) = 28 cfs

CHART 6



*ADDITIONAL SIZES NOT DIMENSIONED ARE LISTED IN FABRICATOR'S CATALOG

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR C. M. PIPE-ARCH CULVERTS WITH INLET CONTROL

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Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
REXMERE DAM	4		
SUBJECT		COMPUTED BY	DATE
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	1/29/80

CHURCHILL LAKE DAM - VITAL STATISTICS OBTAINED FROM FLOYD SNYDER PLANS FROM 1966

DRAINAGE AREA - 654 ACRES + 106 ACRES = 760 ACRES
↓
FROM REXMERE

HOWEVER ADDED DRAINAGE AREA WILL NOT SIGNIFICANTLY INCREASE FLOW SO IT WILL BE IGNORED

ELEVATION	SURFACE AREA (ACRES) - FROM FLOYD SNYDER PLANS
1821	0
1838	3.3
1842	4.1
1843	4.4

SPILLWAY DISCHARGE CAPACITY

$Q = CLH^{3/2} = (3.087)(15.75)H^{3/2}$

ELEVATION	DISCHARGE (CFS)
1838	0
1843	544

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
REXMERE DAM	5		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	1/29/80

DAM FORMED BY ROUTE 23 EMBANKMENT

INFORMATION TAKEN FROM SNYDER PLANS FROM CHURCHILL LAKE DAM.

ELEVATION	SURFACE AREA (ACRES)
1818	0
1825	.63
1830	.79

DISCHARGE CAPACITY - 5'x5' Box Culvert

$Q = CAV2GH = (.6)(25)\sqrt{2(32.2)H}$

ELEVATION	DISCHARGE
1818	0
1830	417

```
************************************                         ************************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)                              NEW YORK STATE
DAM SAFETY VERSION        JULY 1978                           DEPT OF ENVIRONMENTAL CONSERVATION
LAST MODIFICATION  26 FEB 79                                  FLOOD PROTECTION BUREAU
MODIFIED FOR HONEYWELL  79
************************************                         ************************************

   1         A1  [illegible] DAM
   2         A PMF  WITH RATIOS - ANALYSIS
   3         A1 DATE
   4         B    0    20     0    15     0     0     0     0     0     0     0
   5         B1        5
   6         J         1     3     1
   7         J1      .14    .5   1.0
   8         K         0     1                                  1
   9         K1                          INFLOW HYDROGRAPH
  10         M         1     0  1.02                     .7                1
  11         P         0    23   103   107   115   123
  12         T                                                  1      .1
  13         W         2  .323
  14         K         2     2     1
  15         K         1     1                                  1
  16         K1 ROUTED HYDROGRAPH AT DAM  NO BREACH
  17         Y                           1     1
  18         Y1        1                                  -1859     -1
  19         Y4     1859 1862.33 1863.83  1866
  20         Y5        0   156   236   242
  21         $A      .93  1.97  5.85 11.17 13.26
  22         $E     1840  1850  1856  1862  1864
  23         $S     1859
  24         $D     1859   3.0   1.5   350
  25         K         1   950                                  1
  26         K1 CHURCHILL LAKE DAM
  27         Y                           1     1
  28         Y1        1                                  -1838     -1
  29         Y4     1838  1843
  30         Y5        0   544
  31         $$        0   3.3   4.1   4.6
```

```
33      $5  1[illegible]
34      $0  1343     3.0     1.5     3[illegible]
35      K      1    1200                                  1
36      K1  ROUTE 29 CULVERT                              1
37      Y                          1        1
38      Y1     1                                      -1825      -1
39      Y4  1313     1837
40      Y5     0     417
41      $A     0     .63     .79
42      $E  1313     1325    1730
43      $5  1316
44      $0  1350     3.0     1.5     200
45      K      1    1850                                  1
46      K1  LOCATION TOE OF HIGHWAY EMBANKMENT
47      Y                          1        1
48      Y1     1
49      Y6   .05     .05     .05    1800    1340     20     1.5
50      Y7     0    1340     100    1[illegible]     130   1805    130   1800   135   1800
51      Y7   135    1805     500    1[illegible]    1900   1840
52      K      1    2000                                  1
53      K1  LOCATION  TRAILER PARK
54      Y                          1        1
55      Y1     1
56      Y6   .05     .05     .05    1795    1900    150     .03
57      Y7     0    1900     600    1[illegible]     635   1800    685   1795   700   1795
58      Y7   700    1800     720    1[illegible]    1600   1940
59      K     [illegible]
60      A
61      A
62      A
63      A
```

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 0.14	RATIO 2 0.50	RATIO 3 1.00
					RATIOS APPLIED TO FLOWS	
HYDROGRAPH AT	1	1.02 (0.30E 19)	1	421. (11.93)(	1505. 42.61)(	3009. 85.22)(
ROUTED TO	1	1.02 (0.30E 19)	1	239. (6.76)(	1508. 42.69)(	3020. 85.51)(
ROUTED TO	890	1.02 (0.30E 19)	1	234. (6.57)(	1509. 42.71)(	3020. 85.51)(
ROUTED TO	1200	1.02 (0.23E 19)	1	233. (6.59)(	1503. 42.55)(	3014. 85.35)(
ROUTED TO	1950	1.02 (0.23E 19)	1	233. (6.59)(	1503. 42.55)(	3015. 85.36)(
ROUTED TO	2000	1.02 (0.42E 19)	1	233. (6.59)(	1502. 42.56)(	3019. 85.50)(

SUMMARY OF DAM SAFETY ANALYSIS REXMERE DAM

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1859.00	1859.00	1864.00
STORAGE	51.	51.	104.
OUTFLOW	0.	0.	242.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.14	1863.91	0.	103.	250.	0.	42.00	0.
0.50	1865.11	1.11	120.	1508.	4.75	41.00	0.
1.00	1865.84	1.84	131.	3020.	6.25	41.00	0.

SUMMARY OF DAM SAFETY ANALYSIS CHURCHILL LAKE DAM

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	[illegible]	1838.00	1843.00
STORAGE	19.	19.	38.
OUTFLOW	0.	0.	544.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.14	1840.15	0.	28.	234.	0.	42.50	0.
0.50	1843.97	0.97	42.	1506.	3.25	41.00	0.
1.00	1844.86	1.86	46.	3020.	5.25	41.00	0.

SUMMARY OF DAM SAFETY ANALYSIS ROUTE 25 CULVERT

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1425.00	1428.00	1430.00
STORAGE	1.	0.	5.
OUTFLOW	243.	0.	417.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.14	1424.79	0.	1.	243.	0.	0.	0.
0.50	1431.44	1.44	5.	1503.	4.00	41.00	0.
1.00	1432.59	2.59	7.	3014.	5.75	41.00	0.

PLAN 1 STATION 1850

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.14	233.	1801.2	42.75
0.50	1503.	1804.9	41.00
1.00	3015.	1806.4	41.00

PLAN 1 STATION 2000

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.14	233.	1796.1	42.75
0.50	1502.	1800.6	41.00
1.00	3019.	1801.1	41.00

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
**********************************
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**********************************
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
**********************************
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    1          A1  REXMERE DAM
    2          A PMF WITH RATIOS - ANALYSIS
    3          A3 DATE
    4          B    200       0      15       0       0       0       0       0       0       0
    5          B1     5
    6          J      1       3       1
    7          J1   .15      .5     1.0
    8          K      0       1                                       1
    9          K1                                INFLOW HYDROGRAPH
   10          M      1       0    1.02                       .7                      1
   11          P      0      23     100     107     115     123
   12          T                                                   1      .1
   13          V      2    .328
   14          X      2       2       1
   15          K      1       1                                       1
   16          K1 ROUTED HYDROGRAPH  BREACH
   17          Y                                1       1
   18          Y1     1                                        -1859      -1
   19          Y4  1859 1862.33 1863.83    1864
   20          Y5     0     156     236     242
   21          $A   .03    1.97    5.83   11.13   13.26
   22          $E  1840    1850    1856    1862    1864
   23          $$  1859
   24          $D  1864     3.0     1.5     350
   25          $B    30      .5    1845       1    1859    1864
   26          K      1     880                                       1
   27          K1 CHURCHILL LAKE DAM
   28          Y                                1       1
   29          Y1     1                                        -1838      -1
   30          Y4  1838    1843
   31          Y5     0     ...
```

```
$E  1821    1838    1842    1843
$S  1838
$D  1843     3.0     1.5     300
$B    10      .5    1825       2    1838    1843
K      1    1200                                        1
K1 ROUTE 23 CULVERT                                     1
Y                                   1       1
Y1     1                                          -1825      -1
Y4  1818    1830
Y5     0     417
$A     0     .63     .79
$E  1818    1825    1830
$S  1818
$D  1830     3.0     1.5     200
$B    10      .5    1818       2    1820    1830
K      1    1850                                        1
K1 LOCATION TOE OF HIGHWAY EMBANKMENT
Y                                   1       1
Y1     1
Y6   .05     .05     .05    1800    1840      20     1.5
Y7     0    1840     100    1820     130    1805     130    1800     135    1800
Y7   135    1805     500    1820    1000    1840
K      1    2000                                        1
K1 LOCATION  TRAILER PARK
Y                                   1       1
Y1     1
Y6   .05     .05     .05    1795    1900     150     .03
Y7     0    1900     600    1800     685    1800     685    1795     700    1795
Y7   700    1800     720    1800    1600    1840,
K     99
A
A
```

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 0.15	 RATIO 2 0.50	 RATIO 3 1.00
HYDROGRAPH AT	1	1.02 (0.30E 19)	1	451. (12.78)	1505. (42.61)	3009. (85.22)
ROUTED TO	1	1.02 (0.30E 19)	1	1970. (55.78)	2583. (73.15)	3024. (85.64)
ROUTED TO *	880	1.02 (0.30E 19)	1	1991. (56.37)	2574. (72.89)	3001. (84.99)
ROUTED TO	1200	1.02 (0.23E 18)	1	1984. (56.19)	2567. (72.70)	2997. (84.85)
ROUTED TO	1850	1.02 (0.23E 18)	1	1985. (56.20)	2568. (72.73)	2998. (84.90)
ROUTED TO	2000	1.02 (0.42E 18)	1	2013. (57.01)	2605. (73.78)	3047. (86.27)

SUMMARY OF DAM SAFETY ANALYSIS Rexmere Dam

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1859.00	1859.00	1864.00
STORAGE	51.	51.	104.
OUTFLOW	0.	0.	242.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.15	1864.06	0.06	105.	2019.	0.37	42.17	41.50
0.50	1864.31	0.31	108.	2583.	0.48	39.75	39.00
1.00	1864.44	0.44	110.	3026.	0.56	38.73	38.00

SUMMARY OF DAM SAFETY ANALYSIS CHURCHILL LAKE DAM

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1838.00	1838.00	1843.00
STORAGE	19.	19.	38.
OUTFLOW	0.	0.	544.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.15	1844.18	1.18	43.	1991.	0.83	42.25	42.00
0.50	1844.48	1.48	45.	2578.	1.08	39.79	39.50
1.00	1844.70	1.70	46.	3018.	1.17	38.79	38.50

SUMMARY OF DAM SAFETY ANALYSIS ROUTE 23 CULVERT

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1820.00	1818.00	1830.00
STORAGE	0.	0.	5.
OUTFLOW	70.	0.	417.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.15	1831.68	1.68	6.	1984.	1.04	42.25	42.00
0.50	1832.11	2.11	7.	2567.	1.92	39.75	39.50
1.00	1832.39	2.39	7.	2997.	3.50	38.75	38.50

PLAN 1 STATION 1850

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.15	1985.	1805.6	42.25
0.50	2568.	1806.3	39.75
1.00	2998.	1806.4	38.75

PLAN 1 STATION 2000

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.15	2013.	1800.8	42.25
0.50	2605.	1801.0	39.75
1.00	3047.	1801.1	38.75

APPENDIX D

APPLICATION FOR PERMIT AND PERTINENT CORRESPONDENCE

Form E-61A1 (2/62)

STATE OF NEW YORK

DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
BUREAU OF WATERWAYS
ALBANY

Received August 16, 1965 Dam No. 160A-3493 Orig. #71 E & F

Disposition Design approved Nov. 15, 1965 Watershed Delaware River

Foundation inspected .....

Structure inspected .....

Application for the Construction or Reconstruction of a Dam

Application is hereby made to the Superintendent of Public Works, Albany, N. Y., in compliance with the provisions of Section 948 of the Conservation Law (*Chapter 602, Laws of 1959*) for the approval of specifications and detailed drawings, marked The Rexmere Dam, The Murphy Foundation Town of Stamford, Delaware County

herewith submitted for the {construction/~~reconstruction~~} of a dam herein described. All provisions of law will be complied with in the erection of the proposed dam. It is intended to complete the work covered by the application about December 1st., 1965 (Date)

1. The dam will be on a tributary creek flowing into East branch of ~~the~~ of the ~~Delaware~~ River in the town of ~~Stamford~~ Harpersfield County of Delaware and is located 600' north of Route #10 and 300' east of Route #23 (Give exact distance and direction from a well-known bridge, dam, village, main cross-roads or mouth of a stream)

2. Location of dam is shown on the attached map or overlay of the Harpersfield quadrangle of the United States Geological Survey at latitude 42°25' longitude 74° 30'

3. The name of the owner is Fred P. Murphy, The Murphy Foundation

4. The address of the owner is Stamford N.Y.

5. The impounded water will be used for Recreation

6. Will any part of the dam be built upon or its pond flood any State lands? No

7. Does Section 179 of the Conservation Law [redacted] apply to the above named stream? Yes.....; No. X If answer is yes, give Conservation Department's assigned number for permit to change or modify the stream .....

8. The area draining into the proposed pond or lake is 380 acres; 0.59 square miles.

9. The computed 50 year peak rate of runoff used in the design is 400 cu. ft. per sec.

State criterion of method used in determining the peak rate of runoff

Q = C.I.A. I (50 yr.) = 2.55 T = 64 M. C = .40

10. The maximum height of the proposed dam above the bed of the stream will be 27' feet 6" inches.

11. The designed maximum high water elevation above the spillcrest is computed to be 3' feet 6" inches; the designed freeboard as measured from the maximum high water elevation to the top of the proposed dam will be 1' feet 0" inches.

12. The open spillway of the proposed dam that will control the designed flood flow will be of Reinf. Concrete with Corr. Pipe Archs The width of the control section of
(State type, such as: vegetated earth, concrete, masonry, timber, rock filled crib, etc.)

the spillway, measured normal to the flow of water at the crest, will be 16' feet inches in the clear; facing down stream, the waters will be held at the right end by a Reinf. Conc. Walls the top of which will be 4' feet 8" inches above the spillcrest, and have a top width of 16' feet inches; and at the left end by a Reinf. Conc Walls the top of which will be 4' feet 8' inches above the spillcrest and have a top width of 16' feet inches. The slope of the sides of the spillway will be Vert on (left) Vert on (right).

13. The spillway is designed to safely discharge 460 cu. ft. per sec.

14. The surface area of the proposed pond or lake will be 9.44 acres at the normal water elevation and ~~xxxx~~ 10.6 acres at the spillcrest elevation; the volume of the water impounded in the pond or lake will be 18.6 M gallons at the normal water elevation and 29.1 M gallons at the spillcrest elevation.

15a. The normal water elevation of the proposed pond or lake will be 3' feet inches below the spillway crest, and will be maintained by means of a Concrete Spillway; the pond or lake will be drained by means of a 12" C.I.P.; provision will be made for supplying water to riparian owners downstream, during dry seasons, by means of 12" C.I.P.

15b. In addition to normal water control, provision must be made for a bottom draw-off if the pond is on a trout stream of constant flow. The draw-off will be by means of a 12" C.I.P., designed to maintain an outflow of one-half of the minimum inflow of the stream of 0.20 cu. ft. per sec. up to a maximum outflow of one cu. ft. per sec.

16. The maximum discharge through the spillway that controls the normal water elevation will be 460 cu. ft. per sec. during maximum high water.

17. If flashboards are to be used to control flood flow they must be of the automatic or self-tilting type, designed to fail or otherwise permit full discharge through the spillway when the flood waters reach a height of ..... feet ..... inches above the spillcrest.

18. If an overfall structure is used as a spillway, it shall be provided with an apron constructed of Reinf. Concrete; the thickness of the Apron will be 0 feet 6" inches, the width 16' feet ..... inches across the stream and the length 43' feet ..... inches parallel to the stream.

19. Facing downstream, what is the nature of material composing the right bank? Hardpan and boulders

20. Facing downstream, what is the nature of the material composing the left bank? Ditto

21. The natural material of the bed on which the proposed dam will rest is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.) Hardpan and boulders

22. Are there any porous seams or fissures beneath the foundation of the proposed dam? none

23. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc. uniformally hardpan impervious

24. Was the above soil information obtained from soil borings? yes; test pits? .....
Type -Modified undisturbed samples

25. State how much above the spillcrest elevation is the lowest part of the immediate upstream adjoining property or properties, 20 to 60 feet ..... inches.

26. Does this proposed pond or lake constitute any part of a public water supply? no

27. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the proposed dam Washout Routes #10 and 23

28. The design, plans and specifications have been prepared under the supervision of: (Sign on applicable line below).

(a) Wayne E Snyder (Signature) P. E. License No. 21929

Address 16 Clinton Circle Cobleskill N.Y. Phone Cobleskill AF-4-7164

(b) ..... (Signature) U. S. D. A. Soil Conservation Service (Title: Engineer or Conservationist)

(c) ..... (Signature) N. Y. S. Conservation Department Engineer (Title)

(d) ..... (Signature) Other qualified engineer. (Title)

29. The construction (State which: Erection, Reconstruction or Repairs) will be under the supervision of: Sign on applicable line below).

(a) [signature] (Signature) P. E. License No. 21929

Address 16 Clinton Circle, Cobleskill N.Y.

(b) ..... (Signature) U. S. D. A. Soil Conservation Service (Title: Engineer or Conservationist)

(c) ..... (Signature) N. Y. S. Conservation Department Engineer (Title)

(d) ..... (Signature) Other qualified engineer. (Title)

The foregoing information is correct to the best of my knowledge and belief, and the construction will be carried out in accordance with the approved plans and specifications.

[signature] Owner

By [signature], authorized agent of owner.

Address of signer Stemford N.Y. Date Augl, 14th 1965

INSTRUCTIONS

Read carefully, the law setting forth the requirements to be complied with in order to construct or reconstruct a dam.

Determine first whether the stream, across which the dam is to be erected or from which water for the proposed pond or lake is to be diverted, is under the jurisdiction of the Conservation Department. This information may be obtained upon request from the manager of the District Fisheries Office of the Conservation Department which has jurisdiction in the County where the stream is located, the Conservation Department, Bureau of Fish, State Campus Site, Albany 1, New York or the New York State Department of Public Works, Bureau of Waterways, Albany 1, New York.

Before a dam may be erected across a natural water-course, the riparian rights of other land owners (both upstream and downstream) must be considered and customarily their consent be obtained as such rights have been adjudged by the civil courts to be inalienable and inviolate.

The elevation of the impounded water should be maintained at a suitable level below the lowest contour of the adjoining properties thereby preventing inundation of the properties during the highest stage of the waters.

Each application for the construction or reconstruction of a dam must be made on this standard form, copies of which will be furnished upon request to the New York State Department of Public Works, Bureau of Waterways, Albany 1, New York. The application, properly executed, must be accompanied by three sets of plans and specifications. The plans must contain the following information:

a. A topographical plan (with contours) of the impounded area drawn to a suitable scale.

b. A profile and transverse section of the impounded area showing the proposed excavation, the normal water and possible high water elevations. A 1'-0" minimum of freeboard is to be provided between the top of the dam and the possible high water.

c. A longitudinal elevation and transverse section of the dam with all the necessary details of the related appurtenances, spillways, drains, etc.

d. A log of the soil information. Samples of the materials to be used in the dam and of the material upon which the dam is to be founded may be asked for, but need not be furnished unless requested.

No work of construction, reconstruction or repairs of the structure or structures shall be started until after the plans and specifications have been formally approved by the New York State Department of Public Works.

If the dam constitutes a part of a public water supply, application should also be made to the Water Resources Commission under Article V of the Conservation Law, as amended.

An application for the construction or reconstruction of a dam must be signed by the prospective owner of the dam or his duly authorized agent. The address of the signer and the date must be given as provided for in this application form.

September 29, 1965

Re: Rexmere Dam
Town of Harpersfield
County of Delaware

Mr. Floyd E. Snyder, P.E.
16 Clinton Circle
Cobleskill, New York

Dear Sir:

Acknowledgement is made of the receipt of an application Form E-61A1 and three sets of plans and specifications for the construction of the above referenced dam.

The plans have been reviewed. In investigating the design of the structre we prepared independent computations, copies of which are enclosed and your perusal of same is requested.

If you are in agreement with our suggestions it is requested that three sets of the revised sheets be sent this office for review and approval.

Since the proposed dam is to replace the four existing dams, please mark on the enclosed map the location of the structure and return same to us.

Very truly yours,

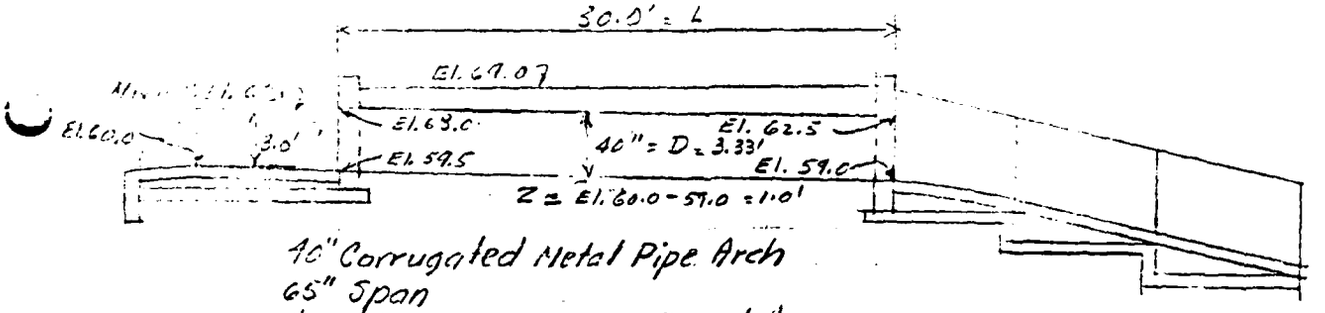
E. C. Hudowalski, P.E.

By:_____
A. Dickinson
Director of Engineering

JEP:fs

Farm Pond Dam

INVESTIGATION OF SPILLWAY SECTION



40" Corrugated Metal Pipe Arch
65" Span
#10 Gage — 14.3 Sq. ft. end Area. = a

Using Bernoulli formula: $H+Z-D=(k_e+\frac{fL}{D}+1.0)\frac{V^2}{2g}$

Assume $k_e = 0.5$ for square edged entry; Manning's "n" for corr. metal pipe = .025

$$f=\frac{185n^2}{D^{1/3}}=\frac{185\times 0.025^2}{\sqrt[3]{3.33'}}=\frac{0.1156}{1.494}=0.0774$$

$$3.5+1.0'-3.33'=(0.5+\frac{0.0774\times 30.0'}{3.33'}+1.0)\frac{V^2}{2\times 32.2}$$

$$1.17'\times 64.4=(0.5+0.7+1.0)V^2$$
$$2.2V^2=75.348$$
$$V^2=34.25$$
$$V=5.86 \text{ feet per Sec.}$$

$$Q=Va=5.86\times 14.3=83.65 \text{ cu. ft. per sec per pipe}$$

$$83.65\times 2=167.3 \text{ cfs. for 2 pipes.}$$

If top of dam is raised 1'-0" to Elev. 65.0'
then a Max. high water of Elev. 64.0 may be assumed

Using same formula as above with H = 4.-'

$$4.5+1.0'-3.33'=(0.5+0.7+1.0)\frac{V^2}{2\times 32.2}$$

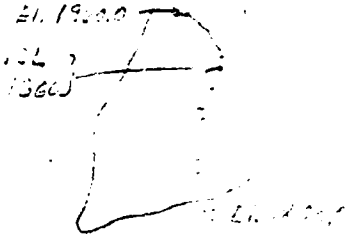
$$2.17'\times 64.4=2.2V^2$$
$$2.2V^2=139.748$$
$$V^2=63.52$$
$$V=7.96 \text{ feet per Sec.}$$

$$Q=Va=7.96\times 14.3=113.83 \text{ cu. ft. per second per pipe}$$
$$113.83\times 2=227.66 \text{ cfs for 2 pipes.}$$

Same results may be obtained if invert

S.G.S. #160

Drainage Area 654 Acres or 1.02 Sq. mi.



PROPOSED DAM AT REXMERE [illegible]
Town of Harpersfield - County of Delaware

Latitude = 42°-25'-19" Longitude = 74°-32'-37"

Drainage Area = 654 Acres = 0.654 - 1000 Acres

Length of Stream = 1.08 miles.

0.3 point of Stream = 1.08 x 0.3 = 0.324 miles

1.08 - 0.324 = 0.756 miles

Refer to USDC Bureau of Public Roads booklet entitled: "Peak Rates of Runoff from Small Watersheds."

Dam Located in Zone 1

Elev. at Headwater = El. 1900.0

Elev. at 0.3L = El. 1860.0 / 100.0' difference.

El. at 0.3L = El. 1860.0

El. at Crossing = El. 1840.0 / 20.0' difference

STEP A

$i = 100.0' \div 0.324$ mi. = 308.5 ft./per mi; $\sqrt{308.5} = 17.56$

$i = 20.0' \div 3.915$ mi. = 26.45 ft. per mi; $\sqrt{26.45} = 5.14$

$T = \left(\frac{0.324}{17.58} + \frac{0.756}{5.14}\right) = (0.0184 + 0.1469) = 0.1285$

STEP B

Zone = #1, P = 1.6"

STEP C

Zone = #1; P = 1.6", H = 0.654 - 1000 Acres; T = 0.1285

$\tilde{Q}_{10AP} = 0.152$ - 1000 cfs.

STEP D

Zone = #1; [illegible] P = 1.6; T = 0.1285 then $\tilde{T}_{AP} = 0.068$

Error = $\frac{0.068 - 0.1285}{0.068} \times 100 = -89\%$ exceeds 30%

STEP E Error = -89%

Zone = #1; T = 0.1285; $\tilde{T}_{AP} = 0.068$ $\tilde{Q}_{10AP} = 0.152$ - 1000 cfs.

$\frac{0.1285}{0.068} = 1.89$ Refer to Figure E-1

Coeff. 'C' = 2.5

$\tilde{Q}_{10(C)} = (0.152 - 1000\ cfs) \times 2.5 = 0.38$ - 1000 cfs.

From Chart E-3

For $\tilde{Q}_{10(C)} = 0.38$ - 1000 cfs; $\tilde{Q}_{25} = 0.53$ - 1000 cfs.

= 530 cfs.

P-4 C 25 YR 30 MIN RUN OFF

August 1, 1[illegible]

Re: Dam #100A-3493
at Rezmere Lake
Town of Harpersfield
County of Delaware

Mr. Floyd D. Snyder, P.E.
[illegible] Clinton Circle
Cobleskill, New York

Dear Sir:

This office, after review of a recent inspection report concerning the above referenced dam submitted to us by our District Office representative, wishes to inform you that the structure and its appurtenances appear to have been constructed in accordance with the approved plans and are therefore acceptable to us insofar as the safety and stability of same are concerned.

In order to provide for an unimpeded flow of water from the 12" dia. outlet pipe, it is suggested the obstructing sands and gravels be removed and a riprapped channel 10.0 ± long be formed.

Very truly yours,

E. C. Hudowalski, P.E.

By: _____
A. Dickinson
Director of Engineering

JEP:fs
CC: Mr. J. C. Federick

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

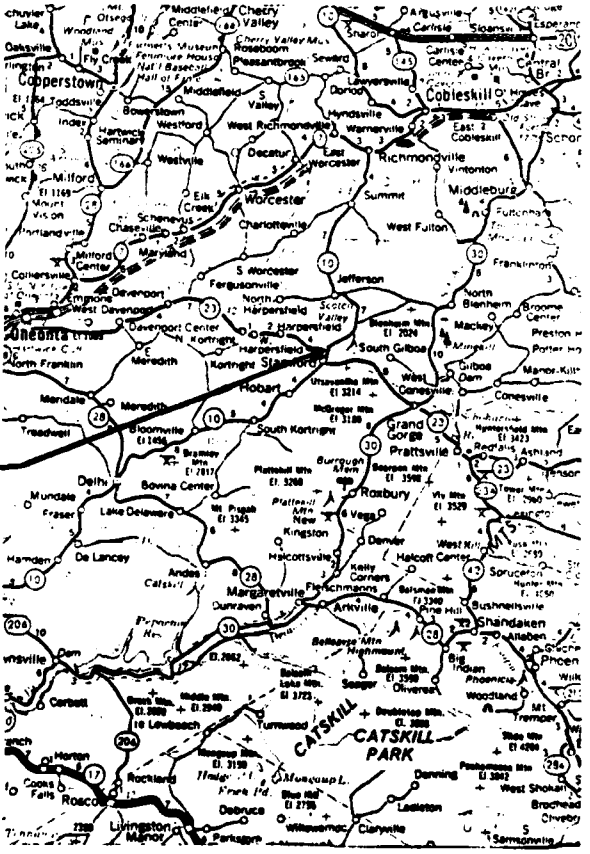
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960

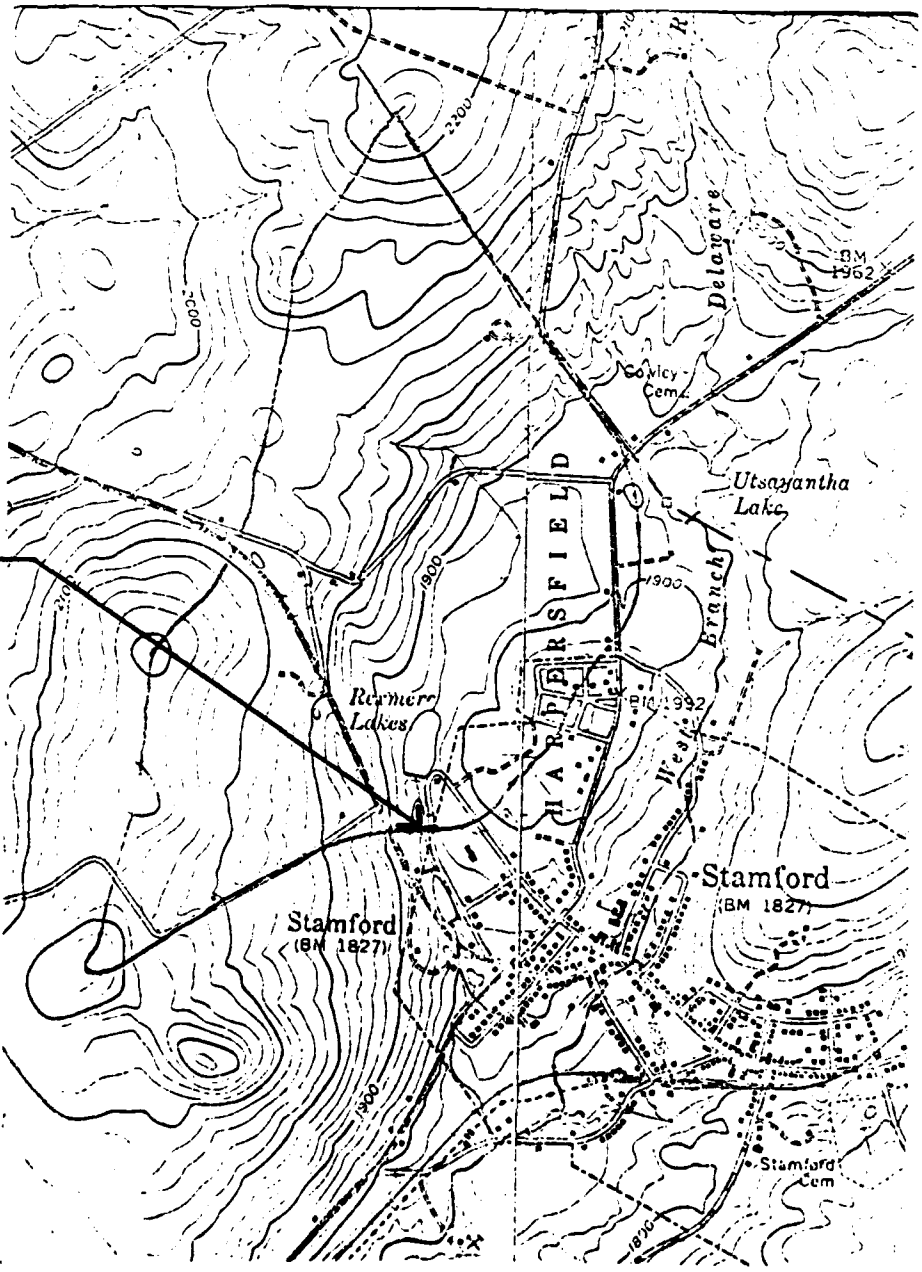
5) U.S. Department of the Interior, Bureau of Reclamation; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

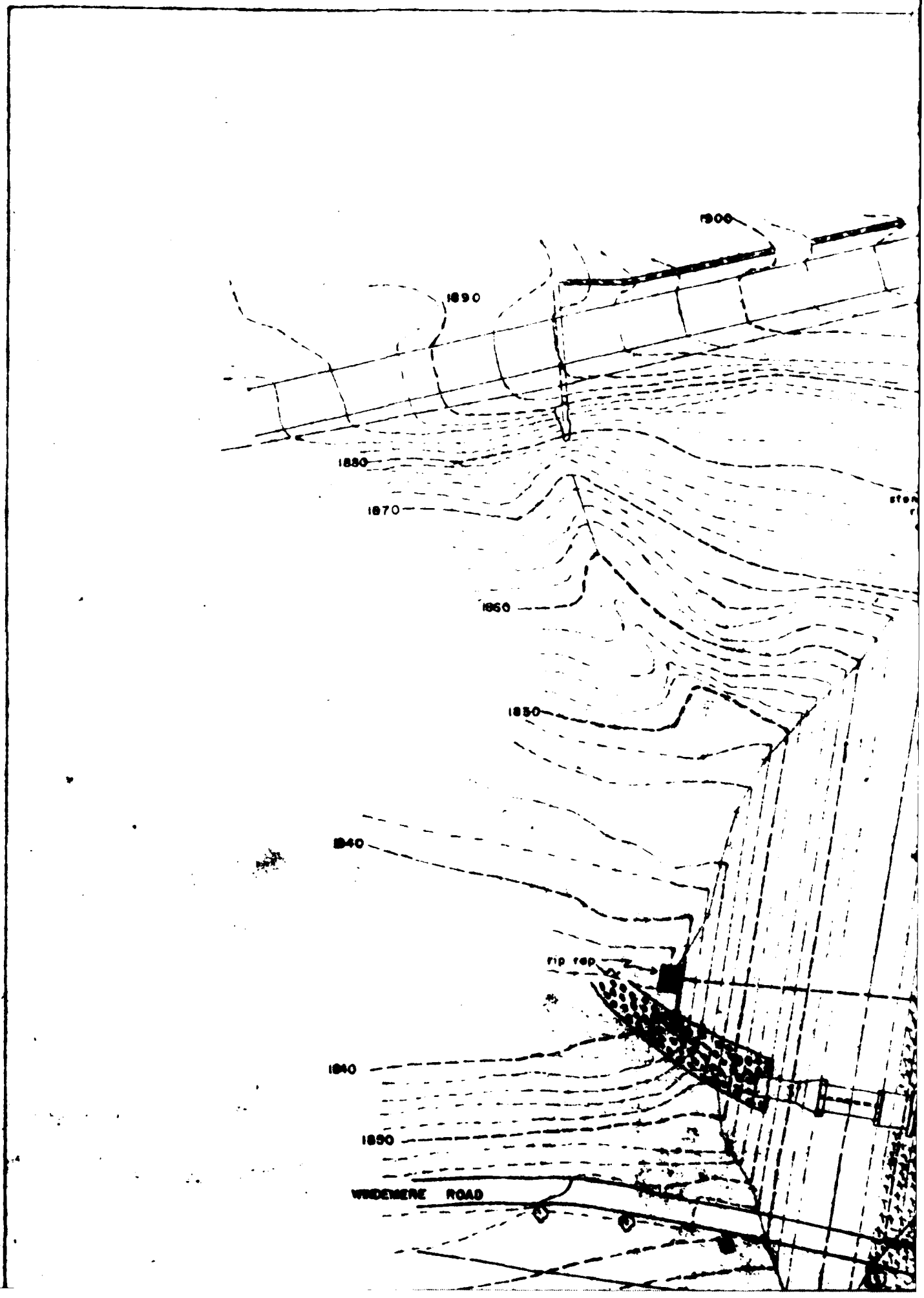
DRAWINGS

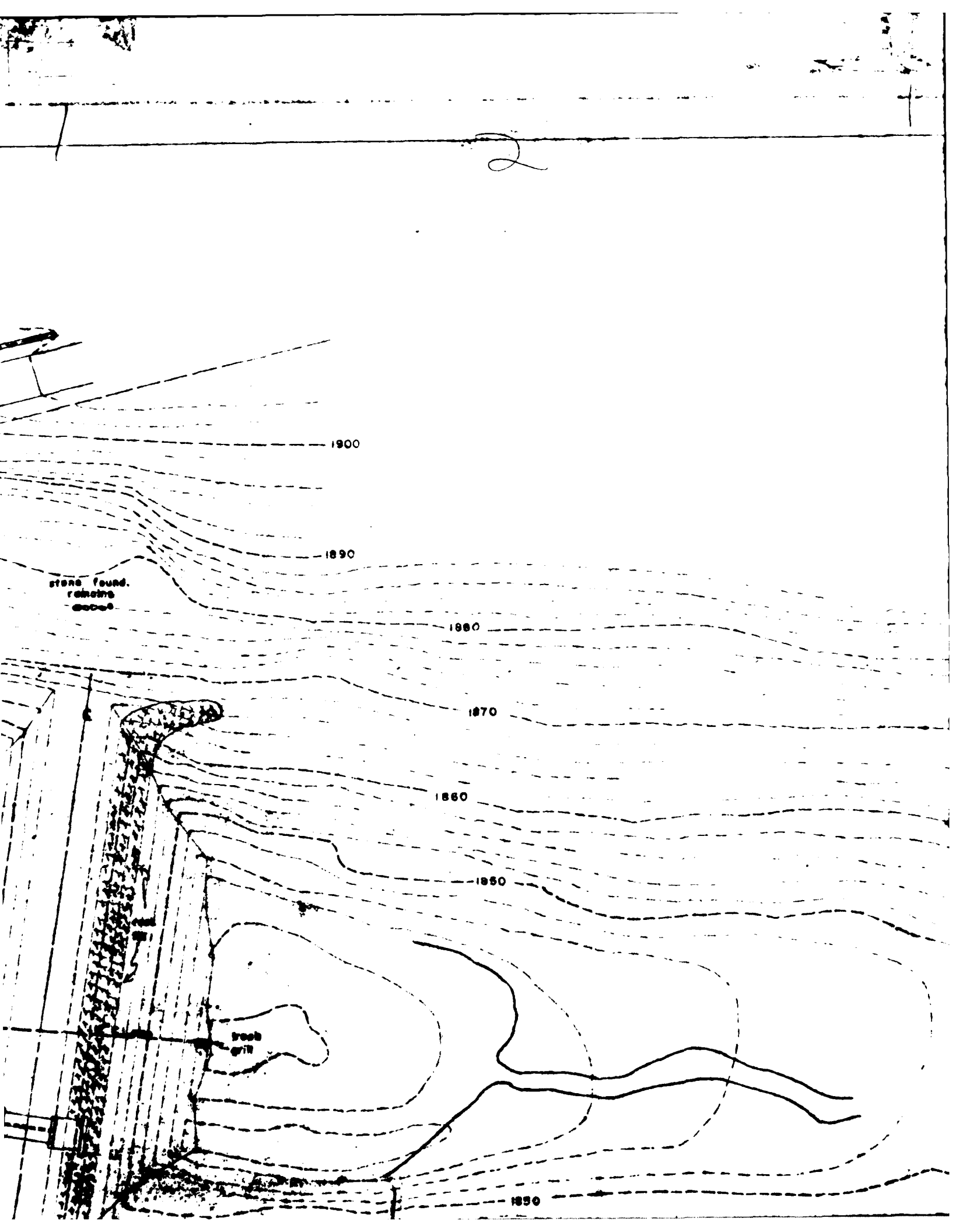


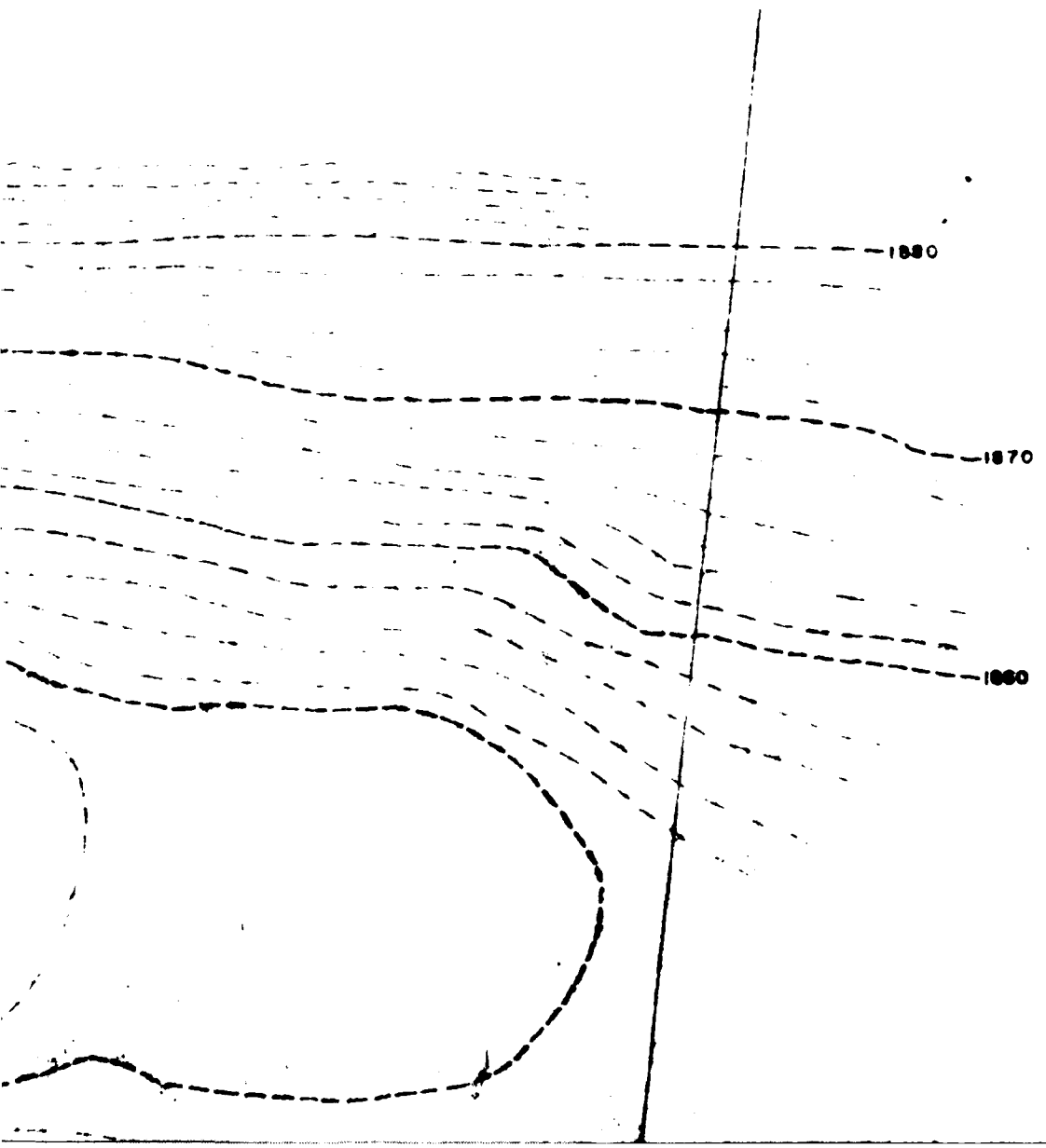
VICINITY MAP
REXMERE DAM
I.D. No. NY 524

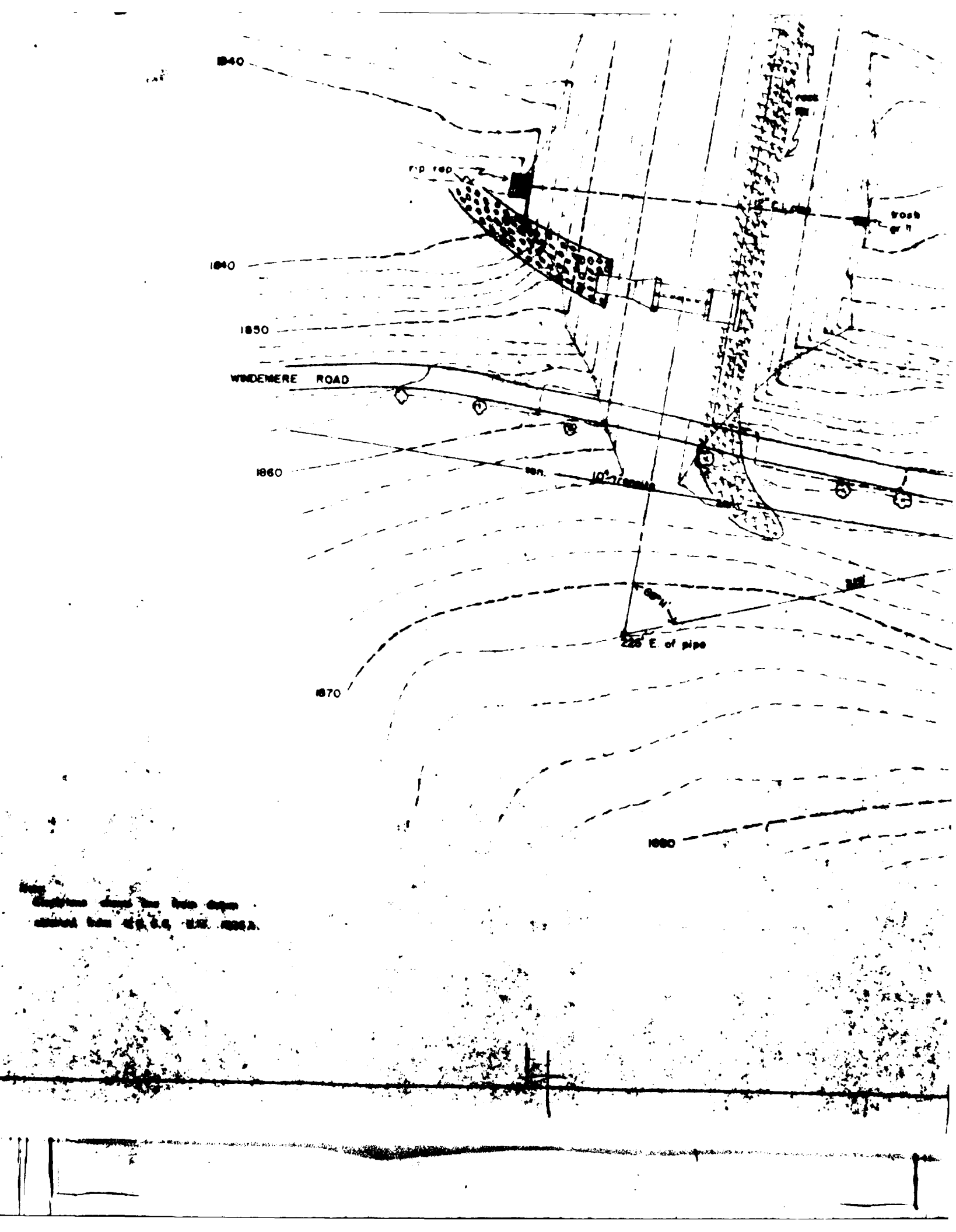


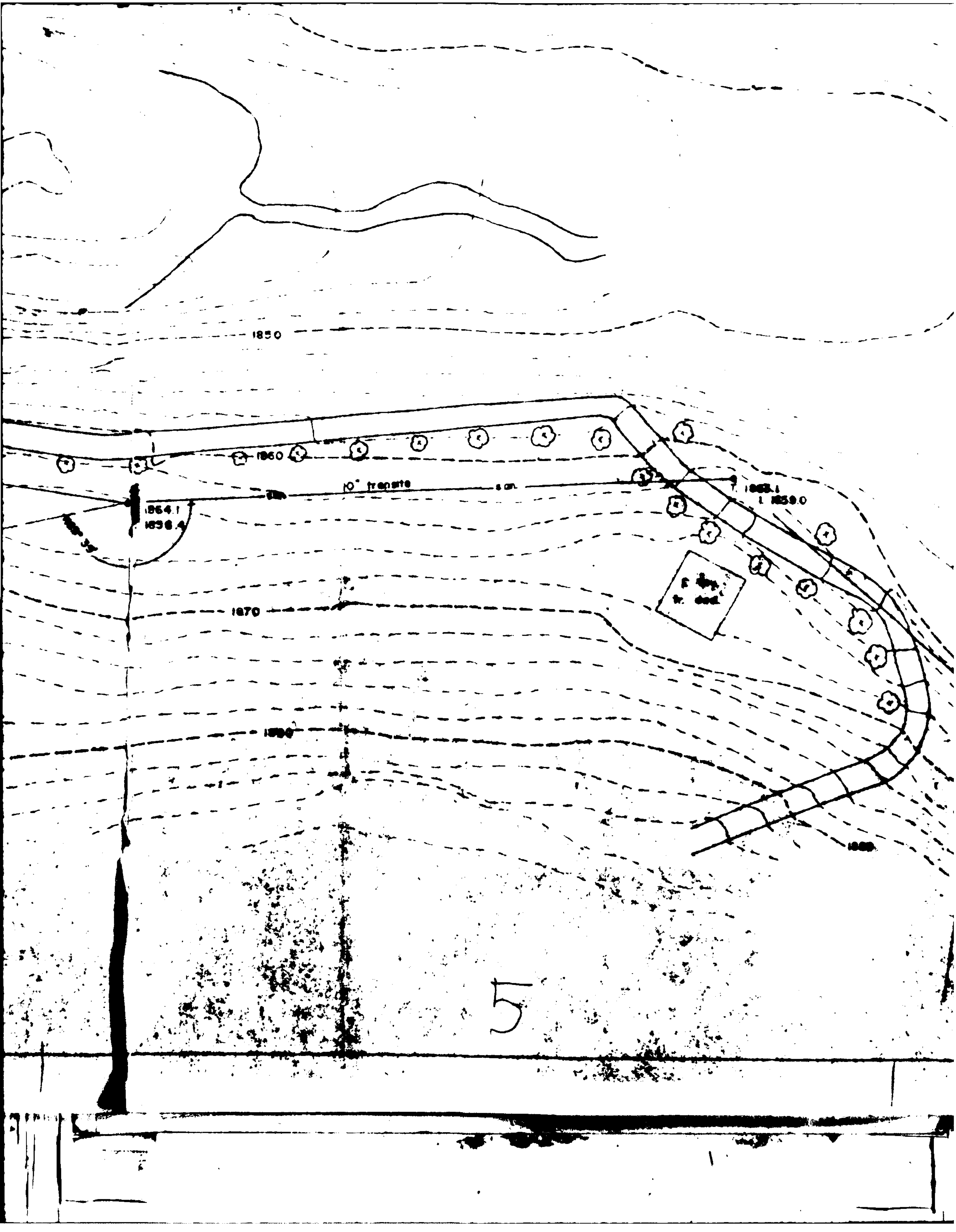
TOPOGRAPHIC MAP
REXMERE DAM
I.D. No. NY 524

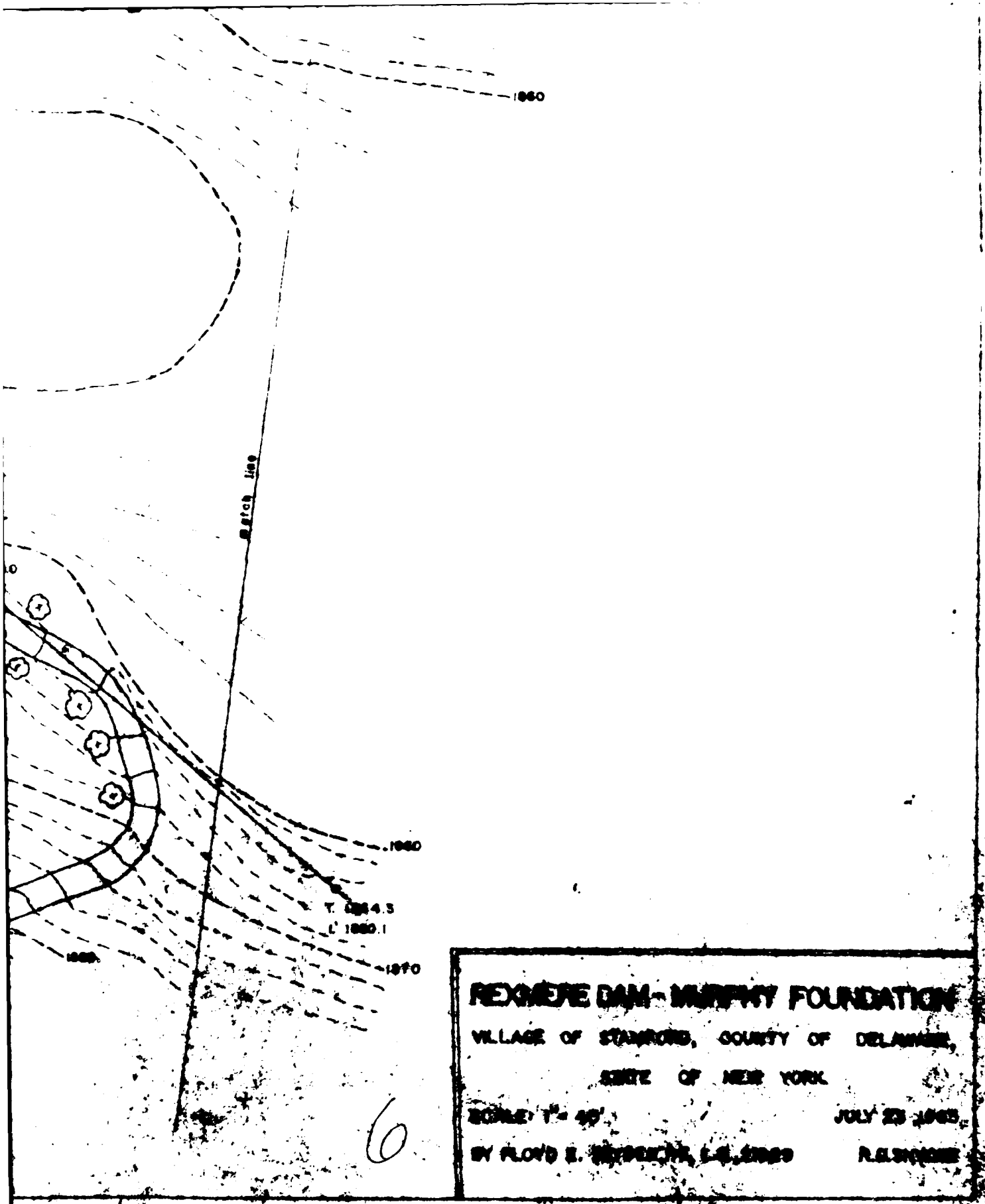

1900
1890
1880
1870
1860
1850
1840
rip rap
1840
1850
WINDERMERE ROAD


1900
1890
stone found, remains
1880
1870
1860
1850
1850


1880
1870
1860


1840
rip rap
1840
1850
WINDERMERE ROAD
1860
1870
1880
225' E. of pipe


1850
1860
10" transite
san.
1864.1
1856.4
1859.0
1870



REXMERE DAM - MURPHY FOUNDATION

VILLAGE OF STAMFORD, COUNTY OF DELAWARE,

STATE OF NEW YORK

SCALE: 1" = 40' JULY 23 1965

BY FLOYD E. [illegible] R.E.S.[illegible]

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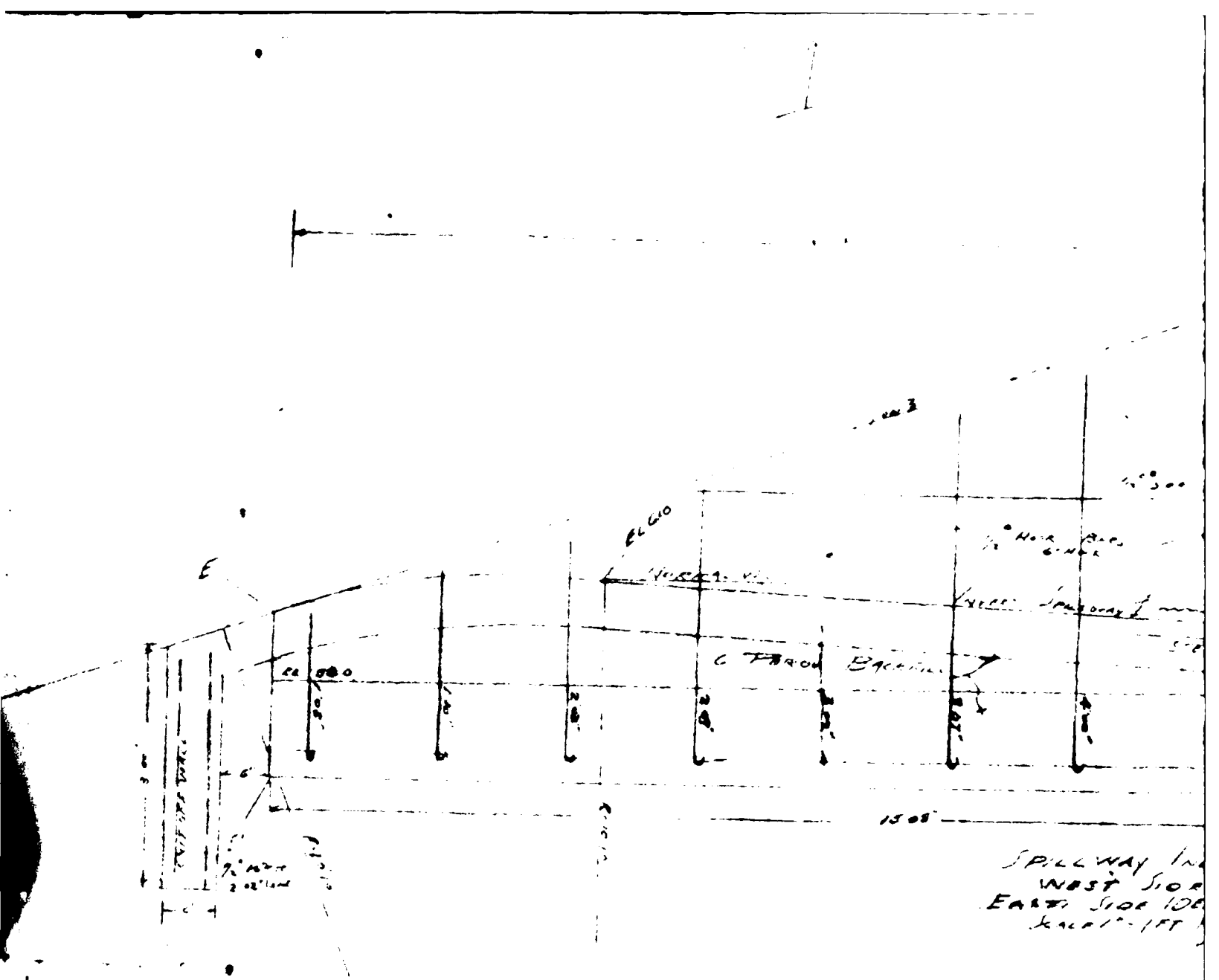
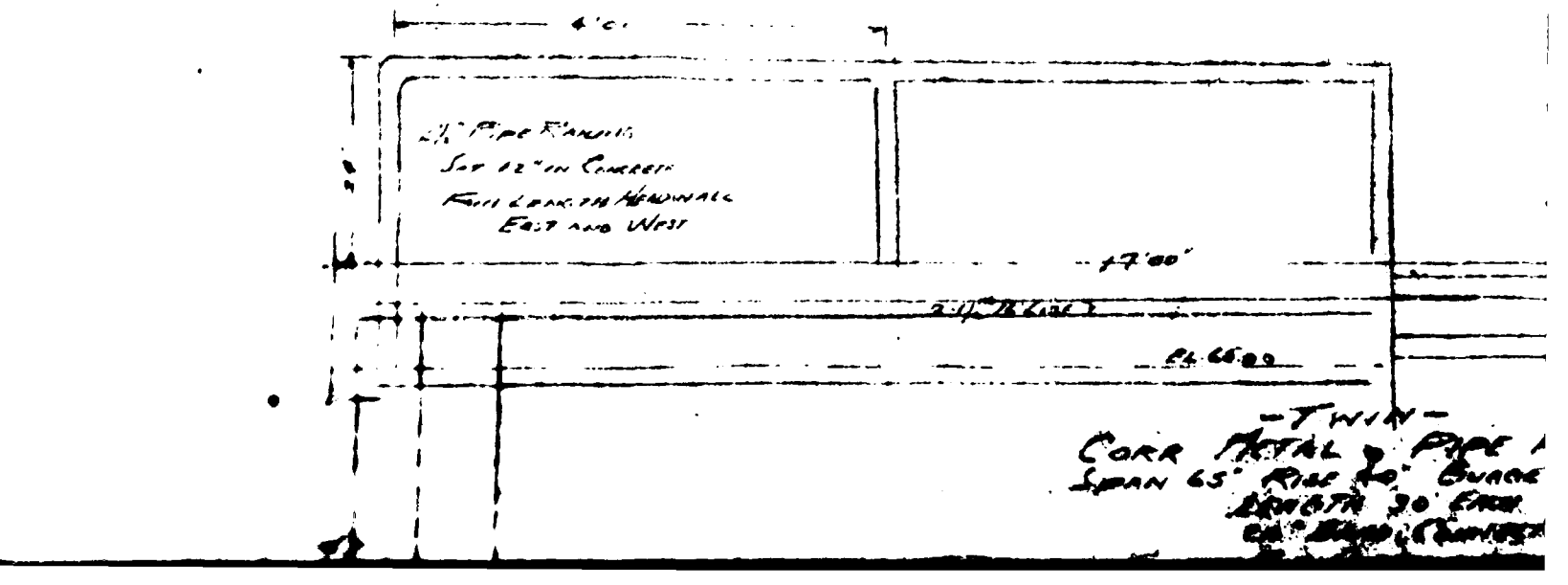
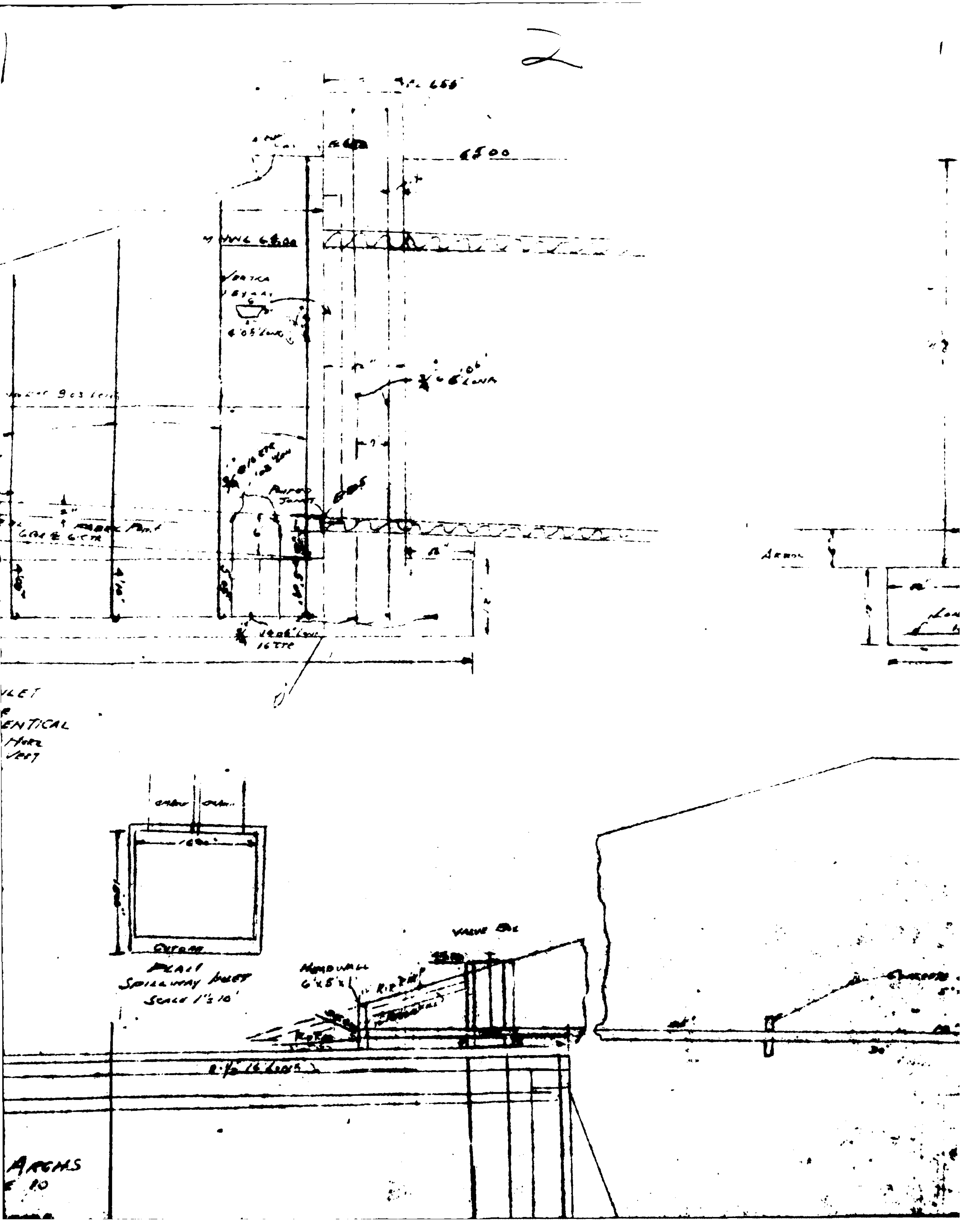
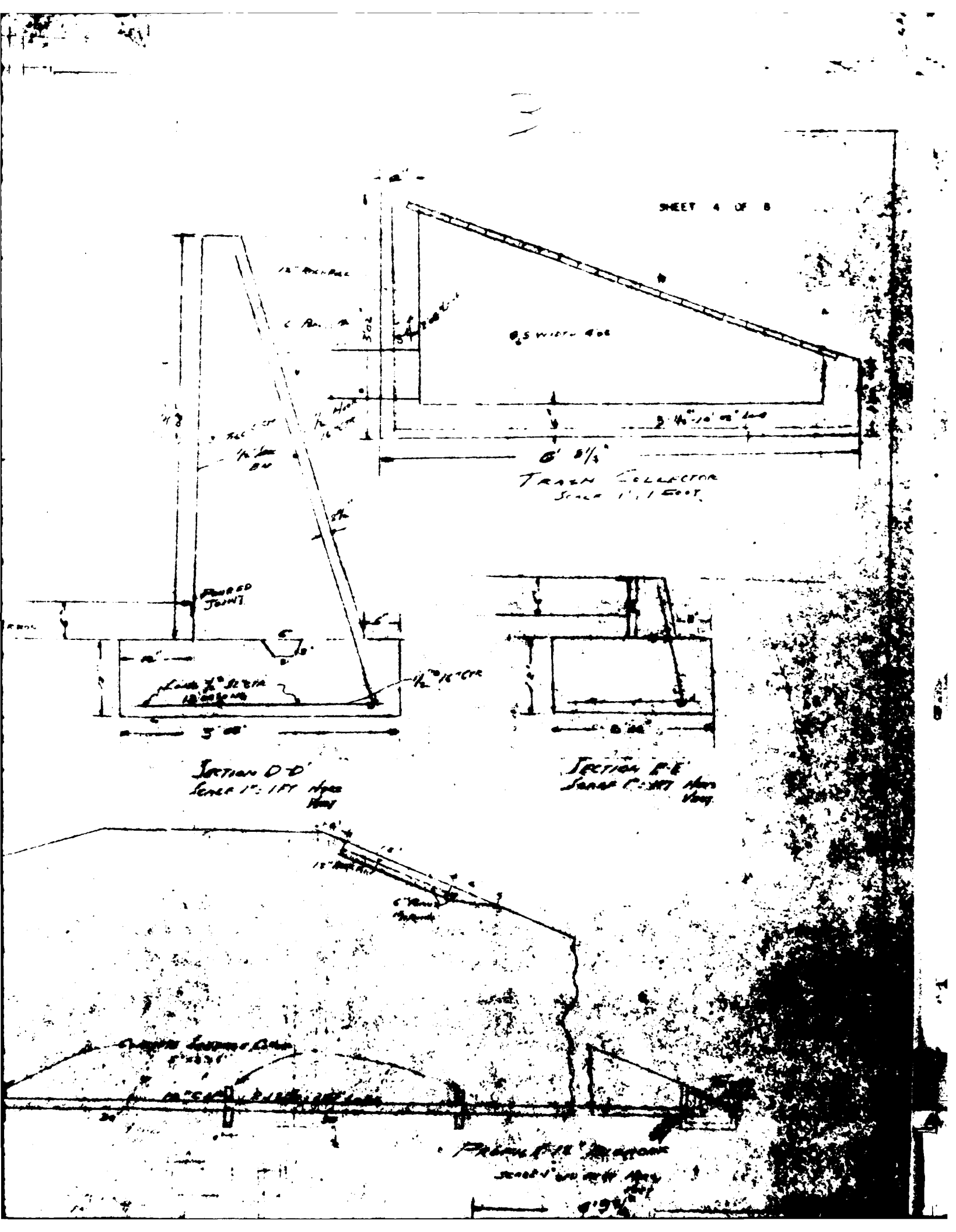
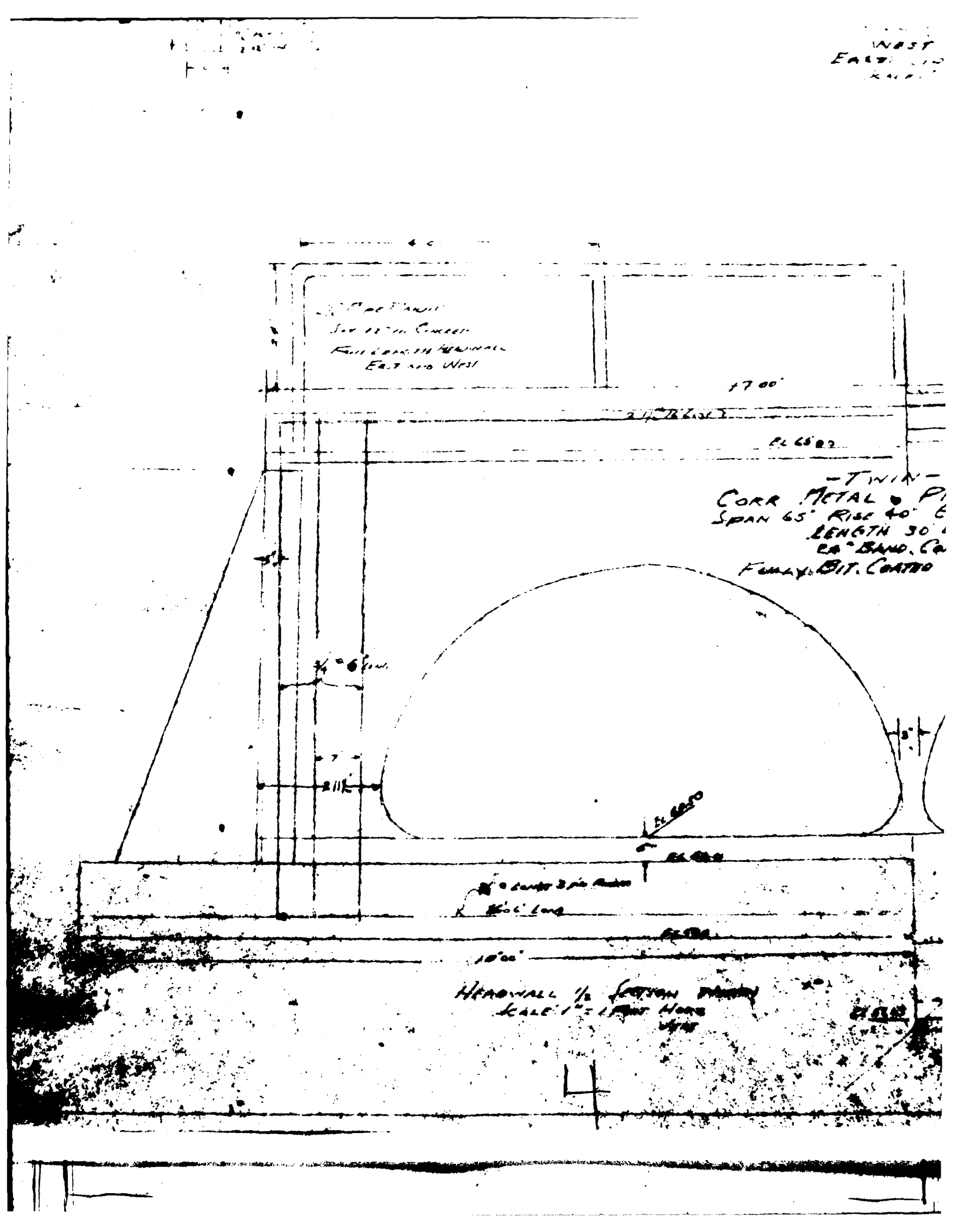
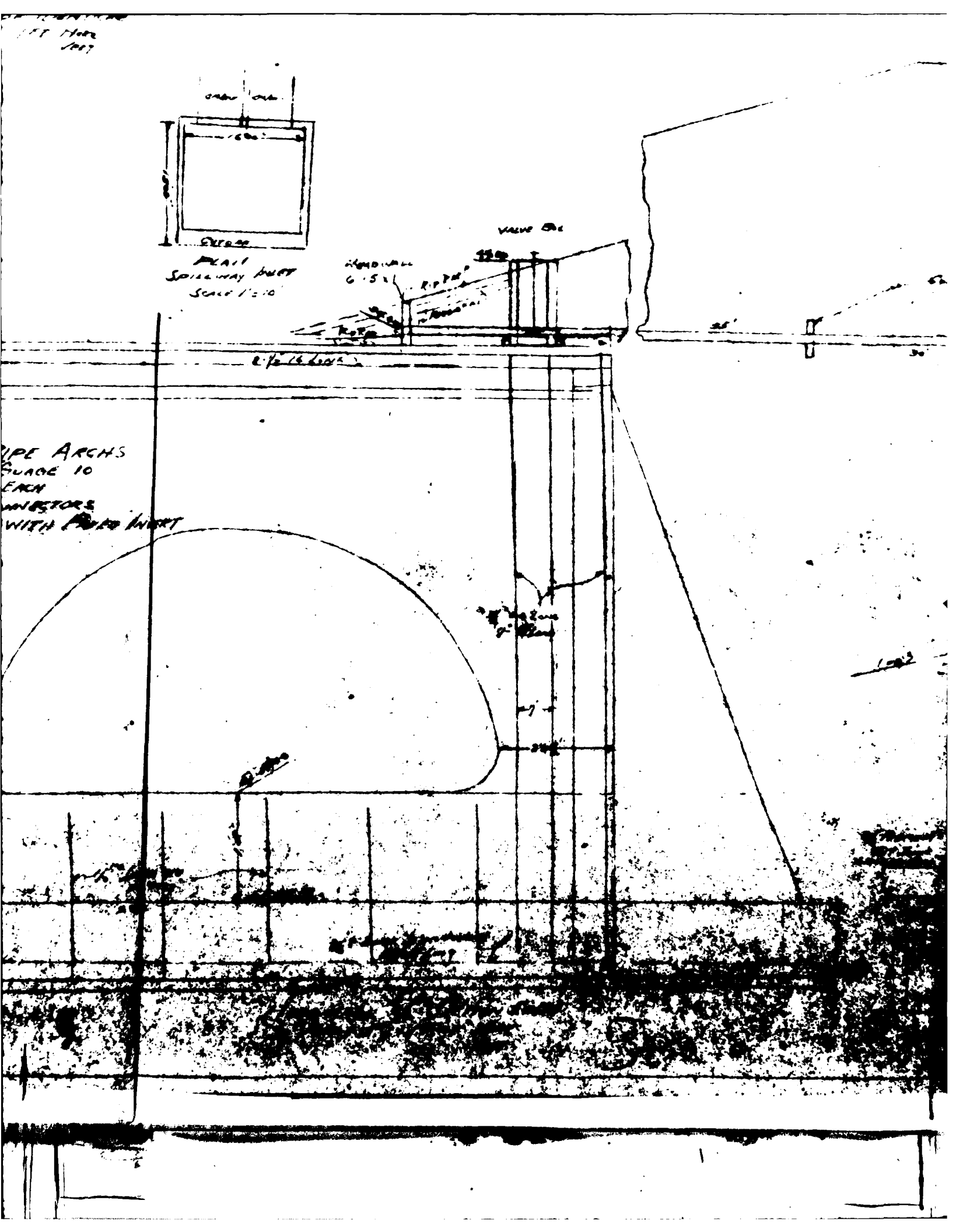

E
EL 600
EL 600.0
15.0'
SPILLWAY IN
WEST SIDE
EAST SIDE 100
SCALE 1" = 1FT

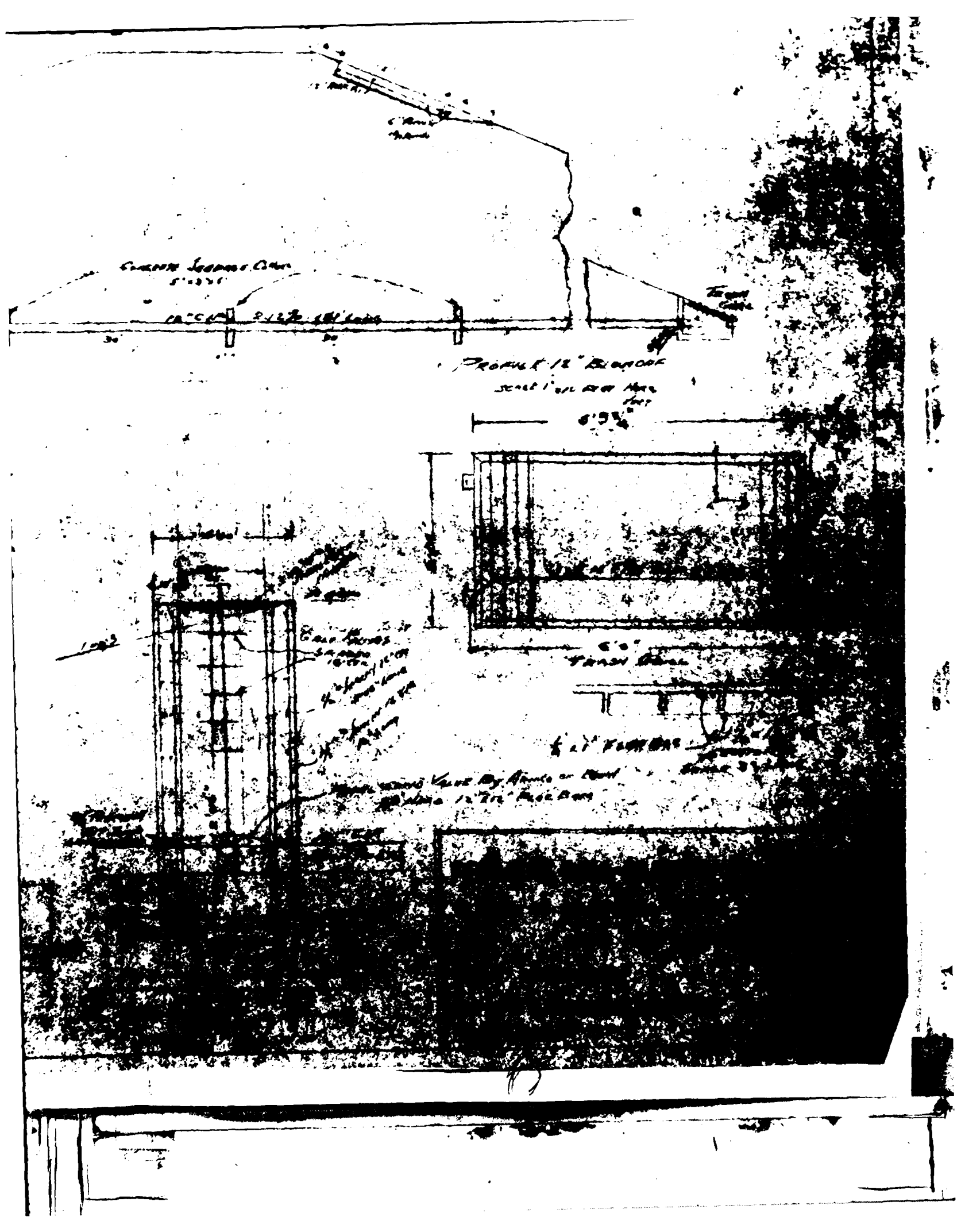

4'-0"
1½" PIPE RAILING
SET 12" IN CONCRETE
FULL LENGTH OF HEADWALL
EAST AND WEST
47'-00"
EL 606.0
-TWIN-
CORR METAL PIPE

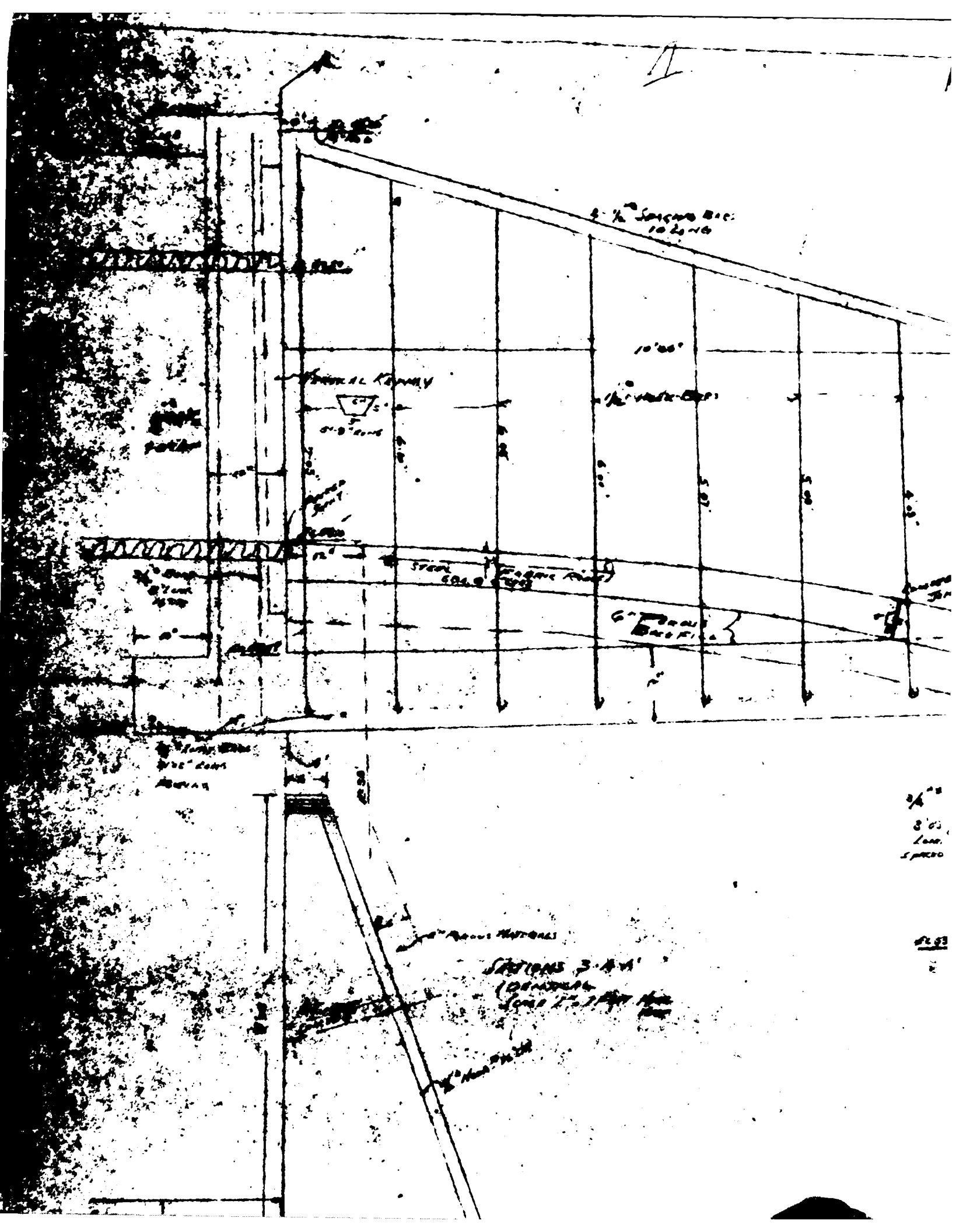

2
6500
VALVE BOX
HEADWALL
6'x5'x1'
PLAN
SPILLWAY INLET
SCALE 1"=10'
OUTLET

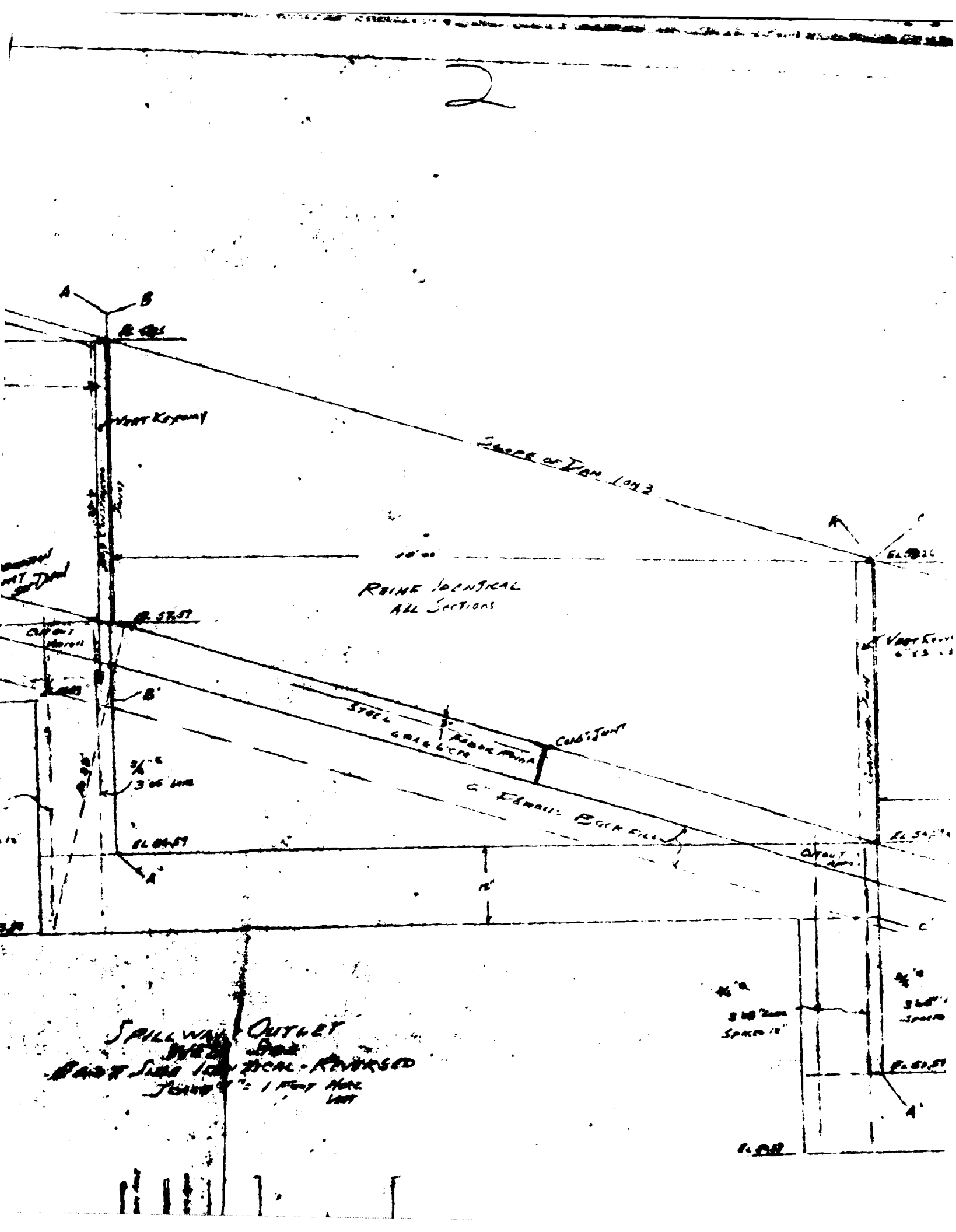

TRASH COLLECTOR
SCALE 1" = 1 FOOT
SECTION D-D'
SECTION E-E'

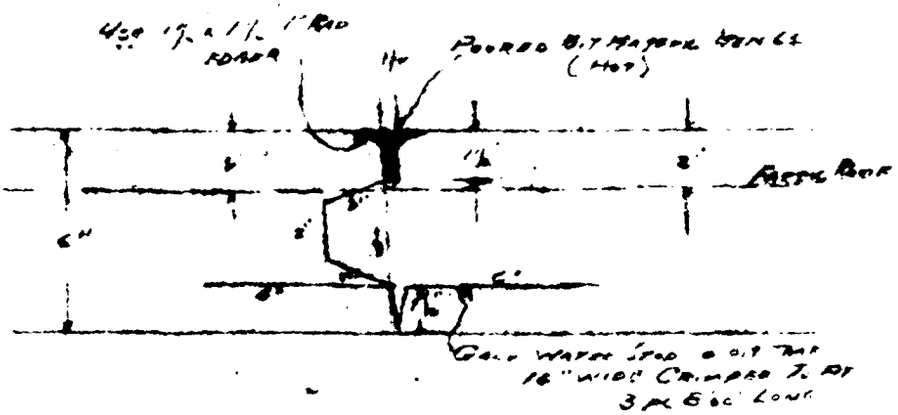

-TWIN-
CORR METAL
SPAN 65'
LENGTH 30'
CA BAND. CA
FULLY BIT. COATED
HEADWALL 1/2 SECTION
SCALE 1" = 1 FOOT


Scale 1"=10
Scale 1"=10



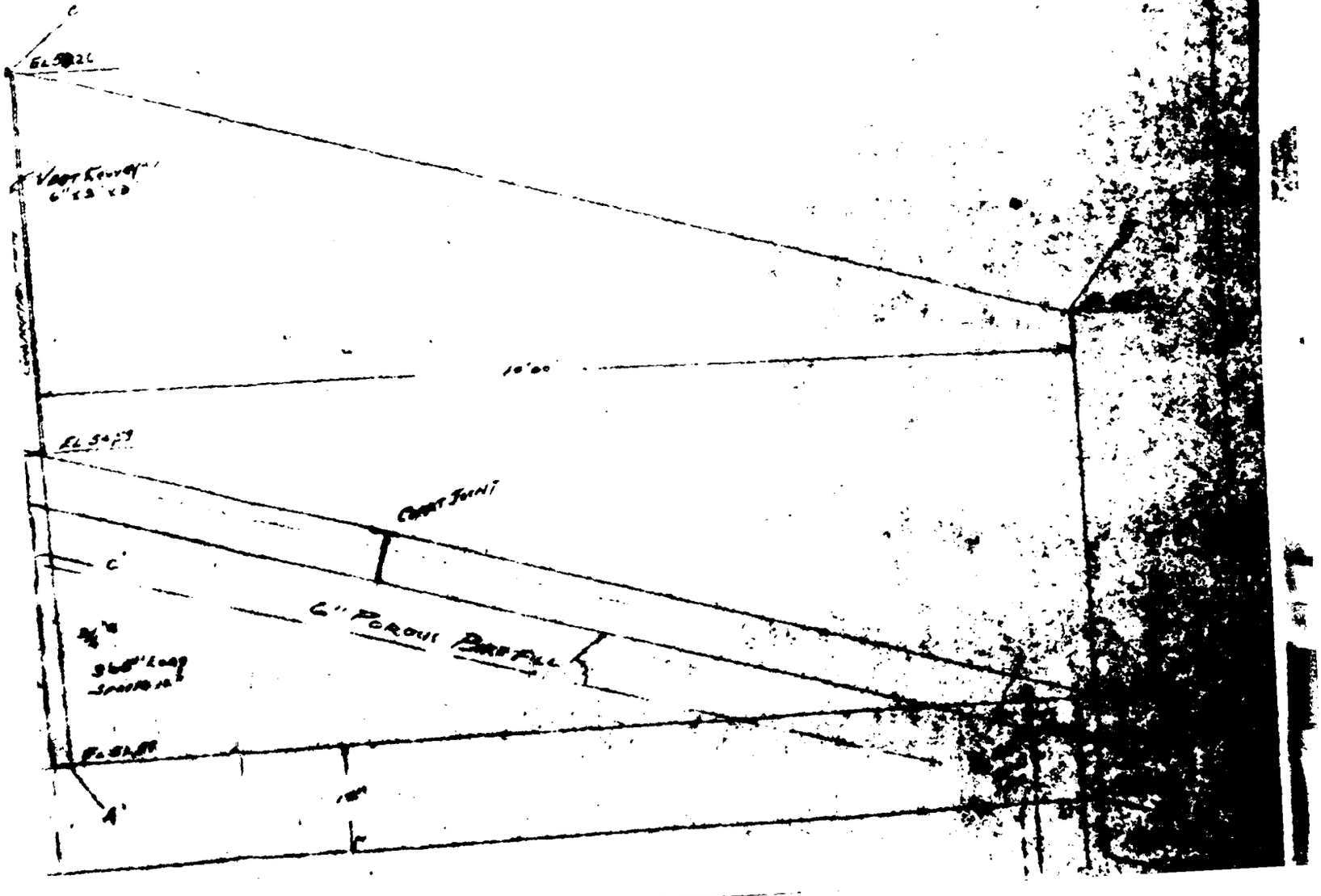


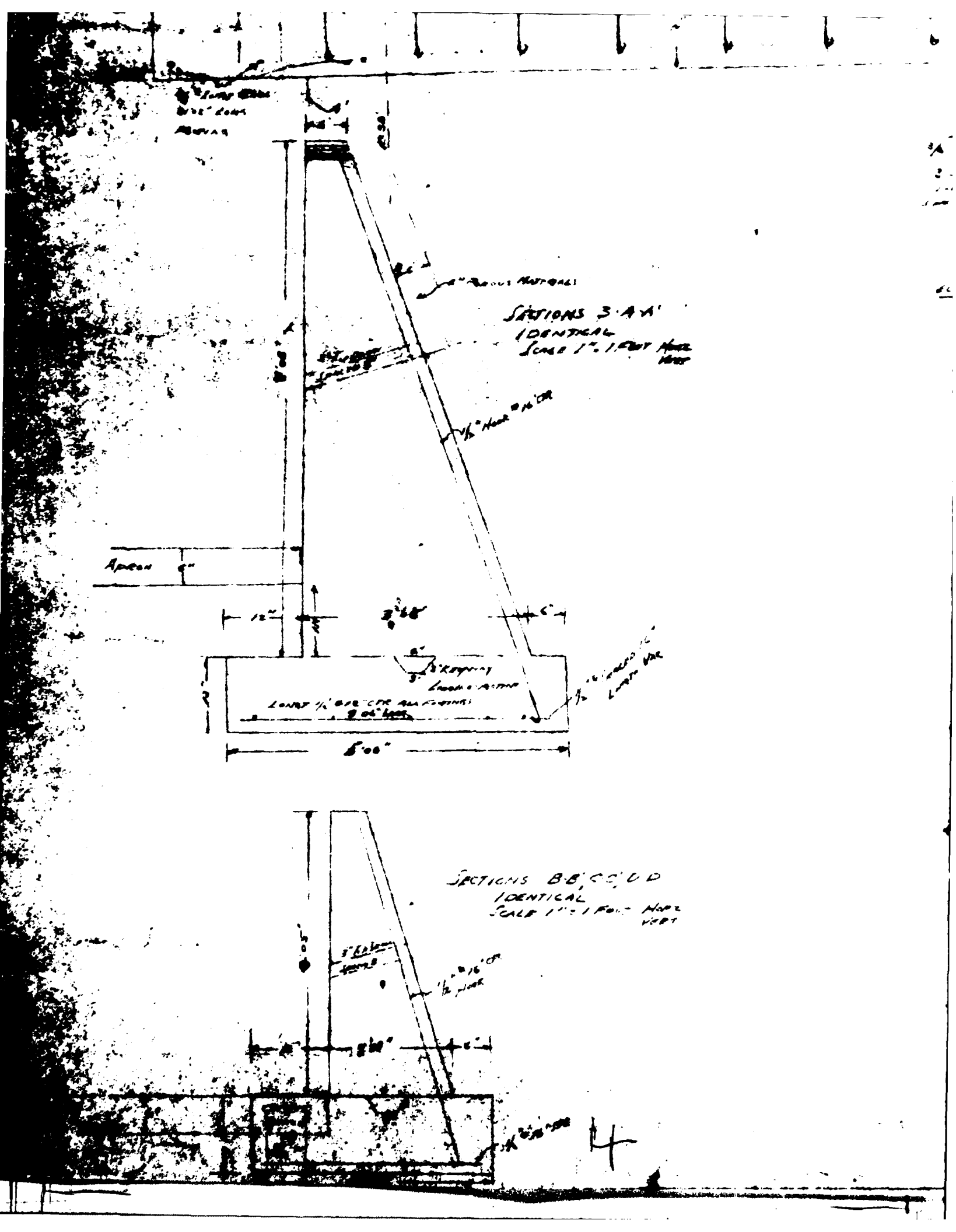

A
B
SLOPE OF DAM 1 on 2
RBINE IDENTICAL
ALL SECTIONS
STEEL
CONC'S JOINT
SPILLWAY OUTLET

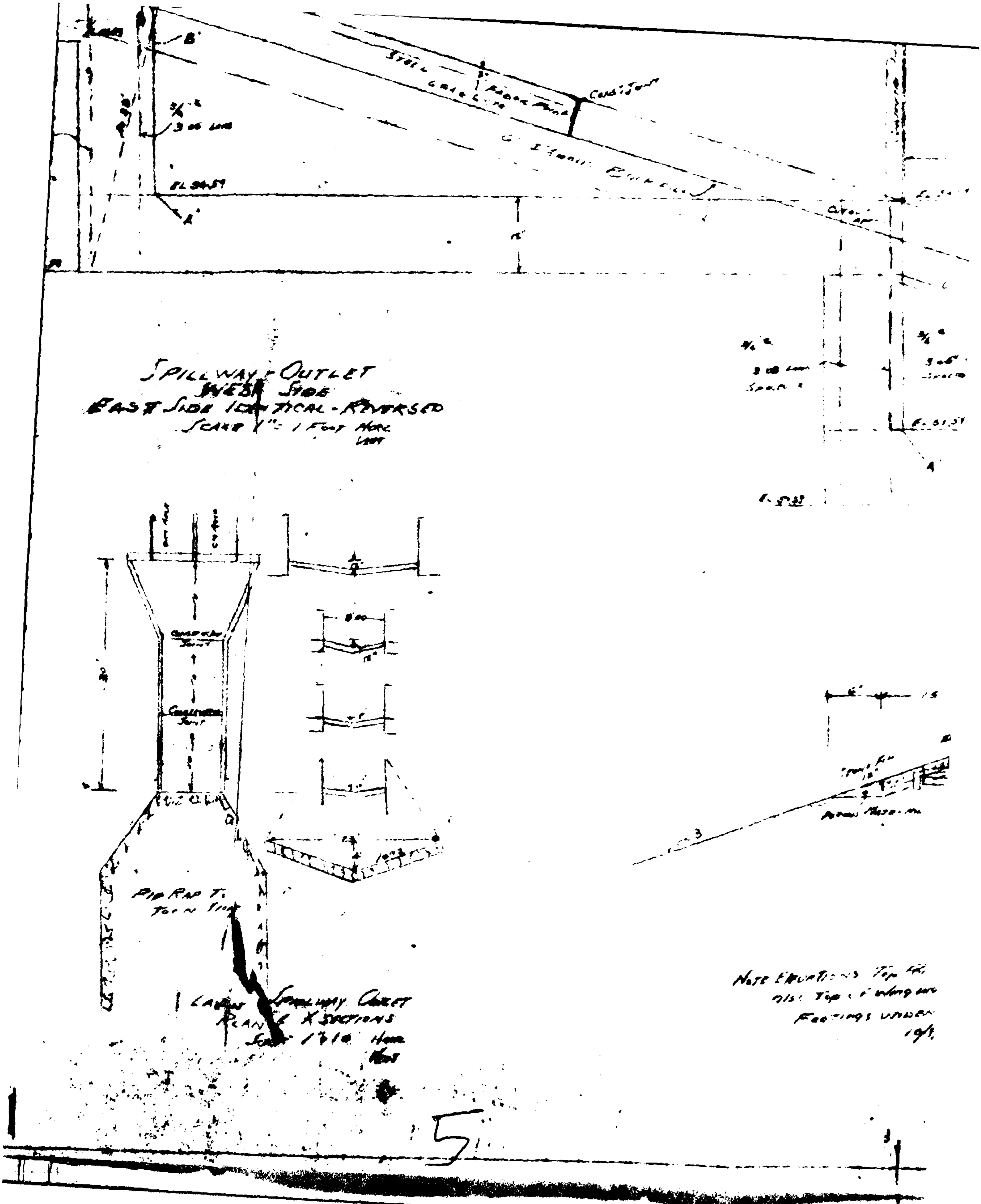


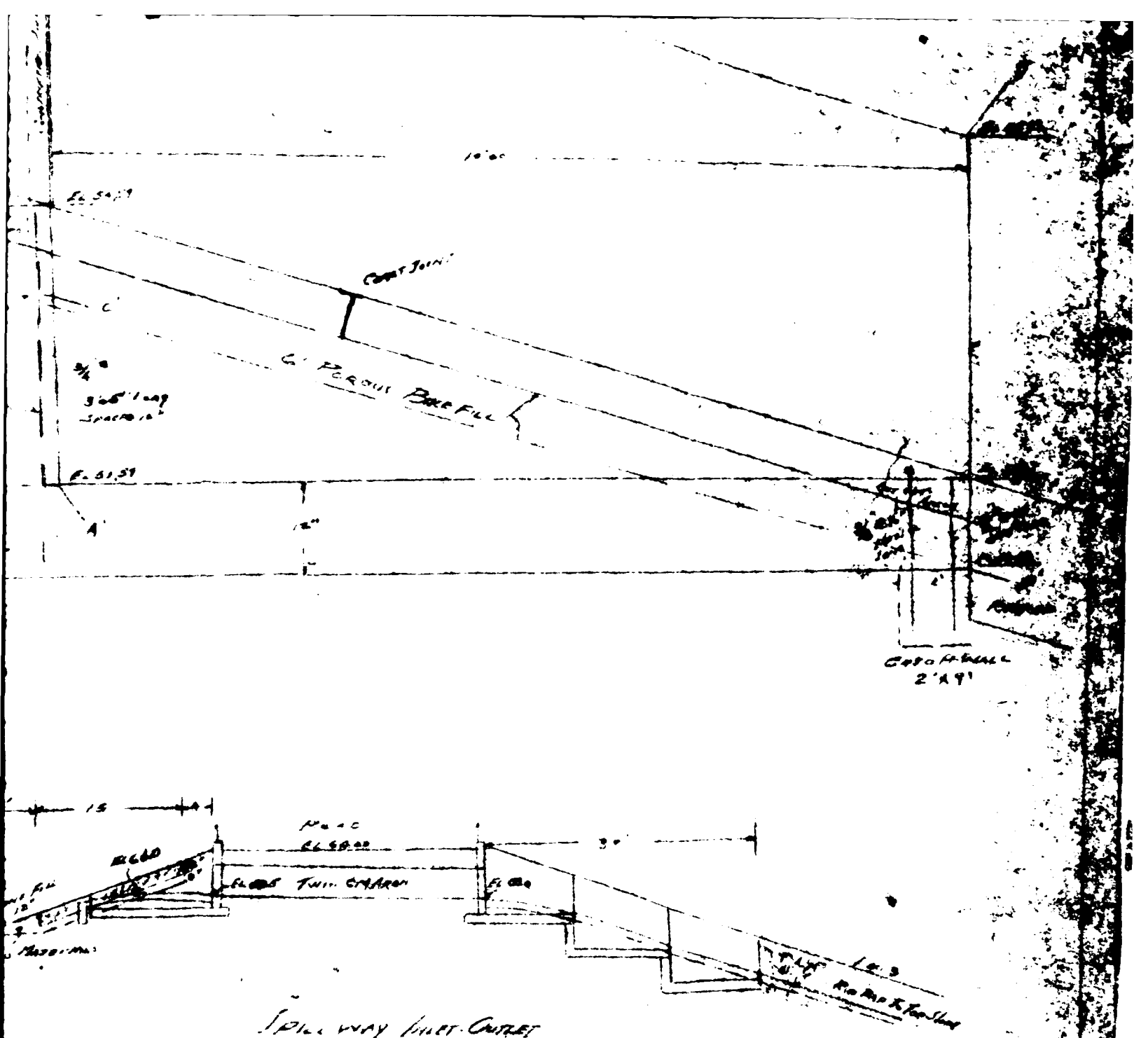
DETAIL - CONSTRUCTION JOINT IN APRON

SCALE 1" = 3'




SECTIONS 3-A A'
IDENTICAL
Apron
5'-00"
SECTIONS B-B' C-C' D-D
IDENTICAL


SPILLWAY - OUTLET
WEST SIDE
EAST SIDE IDENTICAL - REVERSED
SCALE 1" = 1 FOOT HORZ
VERT
CONST JOINT
6" I.D. DRAIN
Construction Joint
Construction Joint
RIP RAP TO TOE
NOTE ELEVATIONS TOP OF
ALSO TOP OF WING WA
FOOTINGS UNDER
SPILLWAY CREST
PLAN & X SECTIONS
SCALE 1" = 10' HORZ
VERT



Spillway Inlet-Outlet
Cross Section
Scale 1"=10' Horiz
Vert

REXMERE DAM - MURPHY FOUNDATION
VILLAGE OF STAMFORD, COUNTY OF [illegible]
STATE OF NEW YORK
SCALES AS INDICATED
[illegible]


DATE
FILME
-8